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CONTENTS

EDITORIALS	253
HOW TO GET THE MAXIMUM SERVICE OUT OF TOOLS.....	256
PROTECTION OF TOOLS FROM LOSS AND ABUSE; JOHN EVANS	256
WATCH THE TOOLS YOU HAVE; J. P. WOOD.....	257
THE FOREMAN'S RESPONSIBILITY FOR TOOL ABUSE.....	257
THE SUPERVISOR, FOREMAN AND LABORER JOINTLY RESPONSIBLE	258
INSTRUCTIONS FOR REPAIRING TRACK TOOLS; F. H. WATTS	259
A NOVEL PROBLEM IN PILE DRIVING.....	260
SPECIFICATIONS FOR TIE PLATES AND BEARING METALS.....	261
ACTIVITIES OF THE RAILROAD ADMINISTRATION.....	263
A. R. E. A. COMMITTEE WORK.....	264
THEY'RE SURE BONEHEADS; M. O. WAY.....	265
THE ROADMASTERS' CONVENTION.....	266
DELAY IN MAINTENANCE WORK BECOMING SERIOUS.....	267
IS IT PRACTICAL TO USE RELEASED TIES AS FUEL?.....	269
CREOSOTED WATER TANKS; C. R. KNOWLES.....	272
STANDARD SPECIFICATIONS FOR CROSS TIES.....	273
A NEW WEED DESTROYER.....	275
THE MATERIAL MARKET.....	277
GENERAL NEWS.....	278

The season of the maintenance of way conventions is now approaching and plans are being completed by the

The Convention Season

officers of these organizations for programs which will be of maximum help to those attending, in meeting the problems confronting them in their routine work. The Roadmasters' and Maintenance of Way Association will meet in Chicago on September 17-19, while the American Railway Bridge and Building Association and the Maintenance of Way Master Painters' Association will hold conventions in the same city on October 15-17. The men who will gather at these conventions this year will meet under widely different conditions from those which existed a year ago. In this interval the government has assumed control of the railways, which in itself has introduced new conditions and new problems. Our continued prosecution of the war has led to an increased stringency in labor and to a greater shortage and, in some cases, an entire lack of materials previously considered essential to the maintenance of the track and structures. Because of the pressure under which railway officers are working there is a feeling in some quarters that the men should not take the time to attend conventions. However, this view is not shared by all, and in some instances the Railroad Administration itself has urged the roads to send to the meetings those men concerned with the problems under consideration. There has never been a time when it has been so necessary for railway men to have opportunity for the complete exchange of views regarding improved practices and methods. For this reason it is to be hoped that those interested in the maintenance of way conventions will now begin to make their plans so that they can be pres-

ent at these meetings and to participate in the discussions in order that their associates may have the benefit of their experience.

It is inevitable that any general plan for increasing the salaries of a large number of employees engaged in a wide variety of duties should result in numerous inequalities. This has occurred in the working out of the award of the Railway Wage Commission. To afford a means for the investigation and elimination of such conditions the Railroad Administration has created a Board of Wages and Working Conditions on which the maintenance of way department has representation. This committee has already organized and is engaged in the collection of information necessary to its consideration of these problems. One of the first questions which has been presented to it is that regarding the inequalities in the pay of some of the foremen who are now receiving little more than the laborers in their gangs, following the relatively large increase which the laborers have received. Even under the most favorable conditions the roads are having difficulty in securing and retaining an adequate number of efficient foremen and any influence which will tend to disorganize the existing forces is to be studiously avoided. It is to be hoped that the Board of Wages and Working Conditions will be able to arrive at a satisfactory solution of this problem in the very near future and that in the meantime those foremen who are the victims of this condition will remain in their present employment with confidence that they will be properly taken care of at the earliest practical date by some form of readjustment.

Discrepancies in the Wage Award

SHOULD PAINTERS DO REPAIR WORK?

A MASTER PAINTER in the maintenance of way department is in a most excellent position to serve as an unofficial inspector of railway structures. He and his men, in their regular work, cover practically every square inch of the buildings and bridges on which they are employed, and by keeping their eyes open they should be able to note all defects which present any outward manifestation. This thought recently led one master painter to suggest that a painting crew on building work should include a carpenter and a tinner, so that such matters as loose boards, leaky roofs, broken downspouts, etc., could be repaired at once without loss of time instead of requiring another of these tradesmen to ride across a division to do an hour's work.

Such an arrangement, however, does not offer much possibility of realization under the present labor famine. Most foremen are reasonably satisfied if they have a full quota of fairly good painters, let alone any happy combination of expert paint spreaders and accomplished jack-of-all-trades. There is also some question as to just how far the master painter should be allowed to go with repairs of this kind without receiving definite authority from his superiors. The character of the man, his judgment, sense of responsibility and other qualifications must needs be taken largely into consideration. Nevertheless, the idea has merit. Maintenance implies the act of keeping in repair and every householder knows how many little details of a building need timely attention if the structure is to be kept in a good condition at a minimum expense. If the paint foreman is not to be granted authority to make such corrections, surely he should be authorized and encouraged to report such defective conditions as come to his attention.

DON'T OVERLOOK THE WATER SERVICE

THERE HAS NEVER been a time when railway men in general have taken as much interest in the treatment of water for locomotives as at present. Remembering the difficulties of last winter and confronted with the prospect that the number of locomotives in service next winter will be no greater if indeed equal to the total in use a year ago, it is natural that railway men are alive to the necessity of getting all the service possible out of the motive power which is available. No work which the engineering and maintenance of way departments can do will be of more direct value to the operating department in increasing the output of work of the engines than that of providing good water, for it is evident that every additional day which a locomotive can be kept out of the shop because of bad water conditions adds that much to its ability to handle traffic.

Water service men have been clamoring for more attention to this phase of their work for years with relatively little result. Now conditions have changed suddenly and operating and mechanical officers are awake to the improvements which can be affected and are supporting recommendations for treating plants in a manner which would have been undreamed of a few years ago. Water service men can not afford to overlook this opportunity to secure the improvements which they have been requesting, knowing that if properly selected and installed, treating plants will effect marked economies in operating costs. Responsibility for initiating many projects of this character lies with the men in charge of and most familiar with water service. It is their duty and their opportunity at the present time to so study the conditions existing at the different sta-

tions along their lines that they may be able to recommend intelligently those plants to which attention should first be directed, indicate the character of installation which should be made and estimate, even though approximately, the improvement which can be affected. One of the most important arguments which can be advanced in favor of water treatment at the present time is the fact that installations can be completed quickly and with relatively limited expenditures compared with the savings affected. In a period such as this when time is an important consideration, the fact that returns can be secured so quickly should not be lost sight of.

THE OUTLOOK FOR TIES

MANY ROADS are short of ties this year. Unless conditions change radically in the very near future this condition will become universal next year. It is the common practice on many railways, particularly where treated ties are used, to anticipate their tie requirements a year. Other roads purchase ties only to provide for their current needs and it is these roads that are suffering most acutely at present from the shortage in ties.

This shortage has been brought about by several causes. Centralized buying which was inaugurated this year has resulted in serious delays in the placing of orders while the details of the method of purchase were being worked out. The prospect of standard specifications has also probably had its effect in slowing up the manufacture of ties. The congested condition of the roads themselves has delayed deliveries, while the scarcity of boats has made relief from coast-wise shipment impracticable.

As a result of their inability to secure the necessary ties important work is being held up by the roads. More serious than this, many tracks are not being properly maintained, the inevitable results of which are only too well known to track men. Bad as the situation now is, the indications are that it will be far worse next year, when all of the roads will be placed on the same footing and the shortage which is now acute principally on the roads depending upon current purchases will become common on all.

The most serious phase of this situation is the fact that ties can not be produced in a day. A considerable number of ties are made by saw mills or by small producers adjacent to the railways. However, the larger portion of the annual output comes from large operators working over considerable areas remote from transportation facilities, who, in turn, negotiate with small producers with limited outputs, which in the aggregate reach large numbers. It is a common experience of such operators that they cannot organize forces of this character in less than six months.

These forces, disintegrated somewhat during the period when the railways were largely out of the market for ties, a couple of years ago, and the universal demand for labor has made it impossible to rebuild these forces. The excellent crop outlook and the high prices which are being paid for these crops are attracting many men from the tie industry. All of these conditions have been accentuated by the uncertainty in the industry itself.

The Railroad Administration has so far failed to meet this situation in an adequate manner. Although the government has encouraged production in the agricultural, munitions and other industries over which it has assumed more or less direct control and has set prices which would tend to stimulate output, the Railroad Adminis-

tration has adopted the opposite course in its negotiations with manufacturers. Rather than stimulating production, it has shown such a tendency to quibble over prices that many manufacturers have diverted their facilities into other channels and the total output has naturally been decreased. This transition is now going on in the tie industry and unless arrested promptly, the output of ties next year will be far less than the roads require. It would seem advisable that every effort be made to encourage all producers of ties, large and small, to maintain, and if possible to increase, their normal output, for without an adequate supply of ties tracks can not be maintained, derailments will occur and the movement of traffic in general will be slowed up.

SPECIFICATIONS FOR TIES

THE PREPARATION of standard specifications for cross ties by the Railroad Administration should result to the mutual benefit of the railways and the producers. As we have pointed out previously in these columns, there are many fields in which standardization results in the arresting of development, while there are other places where uniformity and standardization are to be desired. Uniform specifications for ties fall in the latter class. Up to the present time each road has prepared its specifications for ties in which it incorporated its own provisions as to sizes, character of wood, method of handling, etc.

In many instances two or more roads buy ties in one field and contractors may manufacture them for several roads with radically different specifications. Under this condition it frequently happens that ties rejected by one road with strict requirements are offered to and accepted by other lines with more lenient provisions. With a uniform specification a producer will know that ties acceptable to one road will also be taken by another, removing the danger of rejection. A uniform specification is also a protection to the purchasing agent of the roads. In the past those roads which adhered to rigid specifications have been placed in an unfair position when comparing prices with other roads which were not so strict and which frequently passed inferior ties as belonging to a better grade, securing a lower price thereby on the face of the reports.

Any specification aiming to harmonize a large number of different requirements developed under varying local conditions must necessarily be a compromise. This was particularly true in fixing the grades in the specification which has just been adopted. In order to establish certain sizes of ties as belonging to particular grades it was necessary to change the numbering of the grades from the systems existing on some roads. Since this was necessary the committee went further and reversed the common way of numbering so that instead of a No. 1 tie being the largest, it is now the smallest in general use. While this will probably cause some confusion at first, it is a logical step, for in the future development of track construction to withstand the heavy loads placed on it the indications are that larger rather than smaller ties will be used. The new system of numbering assumes that the railways will never have use for a standard tie smaller than 6 in. by 6 in., but the fact that some roads have recently gone to 7 in. by 9 in. ties indicates that even larger ties may be used in the future. The new system of numbering permits these larger sizes of ties to be added in an orderly manner at any time, a thing not possible under the old plan where the largest tie now in use is known as No. 1.

A further provision of the Central Purchasing Committee requires that all ties be purchased and inspected by the road on which they originate and that they will then be distributed to roads in non-producing territories according to their needs. This again introduces a new feature, as it has been the previous practice for each road to inspect its own ties as purchased. With a standard specification rigidly adhered to, the inspection should be equally satisfactory for all roads, although it is natural to expect that a road which has no supervision of the inspection of the materials furnished to it will be more prone to complain than where the responsibility is placed on its own employees. The success of the unified inspection and in fact of the specifications themselves, depends in large measure upon the care exercised by the Central Purchasing Committee in seeing that this work is done properly.

THE REWARD OF MERIT

A STUDY OF the personal sketches of railroad men given in the news columns in connection with the record of appointments and promotions, from month to month, furnishes valuable food for thought on the opportunities for advancement in railway service. The careers of these men may be divided into four general classes. First, there is the meteoric career, in which the individual is advanced at intervals of a few months or years and attains a position of high authority and compensation in a comparatively short time. Second is the type characterized by advancement in easy stages whereby the man finds himself in an important position by middle life. The third class is that in which reward comes after many years of patient effort, during which there has been little or no recognition in the way of advancement. The fourth class is that in which the man is forever being knocked from pillar to post through long years of intermittent service on railroads in different parts of the country.

In reading these sketches it will, of course, be impossible to assign each one definitely to a single class. Portions of the experience of any one man may fall in several classes. For instance, a man may advance rapidly to a certain point in a short time and then receive no promotion for many years. Success or advancement are dependent on two things, the man and his opportunity. It is as incorrect to say that chance plays no part as it is to assign some man's success entirely to good fortune. The meteoric career may be usually ascribed to a happy combination of marked ability and exceptional opportunity, or rather, an ability to take advantage of the opportunities offered. He who is so unfortunate as to belong to the last class enumerated, has lacked either opportunity or ability or both.

It is the examples of the third class which are more interesting and which offer the most encouragement to the man who has been holding down one job for a good part of his life. It is surprising how many instances of this type of career are found in the news columns from month to month. Many men have been section foremen or extra gang foremen for 20 years or more before being advanced to roadmaster and there are not a few presidents and vice-presidents on the American railroads today who held positions below the ranks of division superintendent for 10, 15 or 20 years before some one "found them." A man of ability may be so unfortunate that his worth does not receive notice for a long time, but the law of averages holds good and sooner or later he will be found out.



HOW TO GET MAXIMUM SERVICE OUT OF TOOLS

Five Discussions of Practical Measures Which the Men in the Field Can Take to Increase Their Life

AT THE PRESENT TIME it is essential that all materials involving the use of steel should be conserved as much as possible in order not to encroach on the demands of the government for military purposes. With nearly a half million men employed in track work, a large number of tools of various kinds are required, all of which require more or less metal in their construction. Furthermore, the heavy demand for these materials and the shortage of capable mechanics in the manufacturing plants has led to a large increase in the cost of tools of all kinds during the last two years. As a result it is more important now than ever before that track men realize the importance of securing the maximum service possible out of these tools which they are using for patriotic as well as economical reasons. It is for this reason that we have arranged for the preparation of the discussions appearing below, pointing out ways in which the roads can increase the service which they are securing from the tools furnished their men.

PROTECTION OF TOOLS FROM LOSS AND ABUSE

By JOHN EVANS

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A study of methods of increasing the length of tool service and reducing tool troubles involves consideration, among other things, of the prevention of loss and unnecessary breakage; the substitution of power for some hand-performed operations which involve extraordinary wear or breakage of tools; improvements in making repairs, and the reclaiming of tools which are in such condition that they might in normal times be considered as fit only for scrap. As an aid toward preventing loss and unnecessary damage, a more accurate accounting for tools furnished deserves consideration. Office records covering tools on hand on the different sections are not apt to receive the care and attention that is given to records of other material. The foreman's monthly report of tools on hand should be checked carefully against his previous month's report, taking into account the tools furnished between the time of making out the two reports and an explanation should be required for any apparent shortage.

In order to prevent an overstock of tools on sections, decision should be made as to what constitutes a reasonably liberal supply of tools for each section and the stock on hand should be governed accordingly. The foreman's report of tools on hand should be checked frequently by actual inventory.

The frequent counting of tools to guard against loss is especially important at the present time. In small gangs the foreman should know personally that tools taken out on the work are returned to their proper places at night. On large gangs some reliable man should be given ample time to make this check and to search for tools that this check shows to be missing. Particular care should be

used to see that tools are not left where they will be buried in dirt or ballast, or where they will be damaged by being run over by trains.

As a preventive measure against unnecessary damage, the use of the proper tool in the proper place is important. As an example of what is to be guarded against in this line one might mention the use of a shovel in doing work which should properly be done with a bar or a hammer. Unnecessary exposure to weather is a common cause of reducing the service life of tools. Tools, when not in use, should be kept under a roof.

Drill points and chisels are particularly expensive now. Work with drills and drilling machines should be handled by the most careful and reliable men available. In the use of chisels, such extra precautions as heating slightly before using in cold weather and using a broad-faced sledge instead of a spike maul in striking them are well worth attention.

In case of extensive rail renewal work around switches it might be feasible to have the rails cut and drilled in the shop in advance instead of handling the work on the ground in the ordinary way, thus doing away with the breaking of drills and chisels. The use of a gas flame in burning off the ends of rails instead of cutting them with a chisel has been tried with apparently satisfactory results in some cases. This would be particularly applicable to rail for use in side tracks where the question of possible damage to the rail by overheating would not be so important. In addition to the saving in tools, there is to be considered the much neater cut obtained by the use of a rail saw or gas flame.

A very large proportion of repaired chisels fail to give satisfactory service. A great many otherwise first-class blacksmiths seem to be unable to repair and temper a track chisel properly. For this reason it is better to have a considerable amount of this work handled at one place so that a specialty may be made of it, or chisels might be returned to the makers for repairs. As these tools are usually shipped in small lots in baggage cars, the question of distance to the repair point is not usually a serious consideration.

A small tool grinder with attachments should be furnished each section crew. There are several good grinders of this kind on the market. Many valuable suggestions on the use and care of tools can be found in railway supply house catalogues. Roadmasters and foremen should study carefully the instructions accompanying special tools or machines.

As examples in the way of reclaiming tools, the following operations are of interest: The separating of good parts from broken parts on shovels, jacks and drilling machines, and the combining of these good parts to make serviceable tools. The cutting of broken claws from claw bars and the welding on of new feet and the welding of new points on picks which have been worn

until too short. All of these are simple operations requiring very little shop equipment. They have all been carried out by some roads and while there is a difference of opinion as to whether the work pays in normal times, present conditions would seem to justify it.

Just now we cannot add the scrap value of the tool to the cost of reclamation, and by comparing the result with the price of a new tool, say off-hand, whether or not the work is advisable. We must consider that, at the present time, the conservation of the material is in itself an important feature. Furthermore, a new tool may not be immediately available at any price and the consequent delay to work is to be considered.

WATCH THE TOOLS YOU HAVE

By J. P. WOOD

Supervisor of Bridges and Buildings, Pere Marquette,
Saginaw, Mich.

At this time more particularly than at any other period in history this subject presents itself with a recurring frequency to the mind of the supervisor until it becomes almost a mania with him as to how best can he arrive at a satisfactory solution. From his position the supervisor knows far better than the field man the difficulties experienced in obtaining new tools, and this places the first responsibility directly up to him to keep in constant touch with his different gangs, and make frequent inspections of the various tools in their outfits to see that none are going into the discard that can be repaired at a moderate expense. This inspection can be made at times when he goes to the several jobs where the men are working, looking over the tools on the work, and when he visits their camp cars, stepping into the tool car, and noting the condition of the tools here. If a monthly or bi-monthly inventory of the tools furnished by each foreman is sent to the supervisor it will enable him to make comparisons from time to time, and note the absence of any tools from the list. He can then take the matter up with the foreman and locate the missing article, when after careful inspection he can determine whether they can be reclaimed or scrapped.

The supervisor should consult with the foreman and, where practicable, call the foremen together at intervals to talk these matters over and exchange ideas, as one may advance an idea that will be of value to all. Also he should appeal to the foremen and men together to use great care in picking up tools at the close of the day's work to see that none are lost, as well as using judgment in the use of them, not only because they are hard to procure, but as a patriotic duty to their country, and the boys over there, some of whom are former working companions, brothers and sons. By so doing they save just so much steel for government use.

The foreman can do a great amount of work along these lines if properly coached. I am satisfied that at the present time not much of this is necessary. Each gang should be provided with a portable tool box equipped with good hinges, hasp and lock, to be kept on its material car, except when the work is some distance from the siding where the camp is located, when it should be moved directly to the place where this work is to be done, so that all tools may be picked up at the close of the day's work, and securely locked up for the night.

In some cases it has been the practice of the men to hide tools in old tie piles, under timbers, and in the grass, where many become lost or rust from dampness, which impairs their efficiency. If a tool box is used and the foreman watches closely this practice will be eliminated, and the men will soon take a pride in looking after the tools

and keep them picked up, as they soon learn the value of this by the better condition the tools are in, and by realizing that they can put their hands upon any tool they may have occasion to use without having to look for it.

The resourceful supervisor and foreman can also devise many other minor ways by which they can get far more service out of their tools than they do at present.

THE FOREMAN'S RESPONSIBILITY FOR TOOL ABUSE

By ROADMASTER

Many track tools are broken and mutilated by using them for purposes for which they were not intended. The practice of using a track shovel to "spear" and drag in ties when making renewals should not be tolerated, as it invariably results in breaking or bending the shovel. Instead, the use of tie tongs for handling ties should be encouraged. Many roads do not furnish them, but where they are in use and the laborers accustomed to them, very good results are obtained. Their use removes the temptation to employ the shovel or pick to drag in ties and thus save tools as well as preventing damage to ties. The shovel is also frequently misused to nip up ties in place of the bar, which results in breaking the handles.

The use of the 10 or 12-lb. sledge in preference to the spike maul for cutting rail and similar purposes should be insisted on. A great saving in chisels and mauls will result, as the maul has too small a striking surface to insure a well-directed blow, and misplaced blows chip chisels and mauls, break handles and frequently cause personal injuries from flying pieces of steel thus broken off. The maul will batter very quickly when used where the resistance is too great.

The chisel should not be used to cut bolts. Take them off with the wrench and save both the bolts and the chisel. It is also very hard on a chisel to use it between rail ends to drive expansion, as is frequently done. This practice also often results in chipping the top of the ball of the rail, which will start a battered joint. When necessary to drive expansion, take off the rail fastenings, raise the end of the rail which is to be driven back a couple of inches above the top of the adjoining one and use another rail against this raised end to drive it back with. This will not damage the rail or fastenings and for that reason should be favored over the practice of trying to drive steel back by driving against the end of the rail joints, which batters the end of the joint and breaks bolts.

The track drill is very often abused by overfeeding. Men using it should be taught to regulate the feed, and not rack the drill and break bolts by overfeeding. Care should also be taken when placing the drill to see that it sets firm and level. The tamping bar is often broken by using it for a nipping bar. The claw bar is impaired and often broken by unnecessary pounding on the heel to start a spike. While this may be necessary at times to start a hard spike, it is much overdone. Good results can be had by always remembering to tap down a spike before starting to pull it, thus breaking its hold in the tie.

The adz is a hard tool to care for properly and keep in working condition, as much work for which no sharp tool was intended is expected of it. It is often misused for tapping down spikes and similar purposes when a maul is not at hand. The small emery wheel tool grinder which can be kept constantly with the gang should be furnished all sections. It is a great factor in keeping sharp-edge tools in shape, is a labor saver and is a vast improvement over the cumbersome grindstone.

The track jack is frequently overloaded when pulling up track around turnouts, etc. Too much should not be expected of one jack. Enough should be used to get results without overloading them. They should never be thrown down in the ballast and let to fill up with gravel, which will cut them out. Wooden handles will warp when exposed to the weather. When tools equipped with them are not in use they should be kept inside. When it is noticed that handles are beginning to warp they should be weighted down to straighten them, which will have the desired effect if adopted in time.

When track tools are not in use they should be kept in the toolhouse at all times. Those in use during the day should be brought in with the gang at night and not left out, exposed to the weather or to be lost or stolen. If all foremen lived up to this rule a great saving would result. In the case of large gangs, where it is too inconvenient to carry tools in and out each day, portable tool boxes with locks should be provided and their use insisted on.

A district or division tool repair shop under competent supervision is the greatest factor in prolonging the life of tools. A regular system for the exchange of worn and broken tools for those that have been repaired should be conducted. A car in charge of a man from the repair shop should go over the railroad at regular intervals, being met by the foreman of each section and exchanges made. This does away with the delay and loss to tools in transit.

Most trackmen are familiar with the abusive practices to which track tools are subjected. The idea that should be brought home to every one at this time is the seriousness of the tool shortage which threatens, and the necessity of seeing to it that these practices are stopped and that we get the maximum service out of every tool furnished. This result can be accomplished, but, like other track problems, it rests largely with the foreman and depends on his close and constant supervision.

THE SUPERVISOR, FOREMAN AND LABORERS JOINTLY RESPONSIBLE

BY ASSISTANT SUPERVISOR

Within a comparatively short period of time the tool equipment of a track gang has undergone a radical change. The old and familiar hand tools are still a part of the foreman's tool equipment, but a constantly increasing proportion of the track work is being done with what may properly be called machine tools. The present market conditions as regards both price and delivery make it important that the maximum economy be realized in the use of all tools. It is also of increasing importance that the factors entering into the design of tools and their proper maintenance should be a subject for careful study to insure that the tools purchased are specially adapted to do the work required.

The most important factor that enters into the securing of a maximum of service from track tools is the foreman. In his position of custodian of his equipment he can see that unnecessary roughness in the use of the tools is eliminated to a large extent. Another opportunity which the foreman has at all times to help the tool situation is to see that good care is taken of his tools. He should see that all tools are collected every night and put in a safe place and under cover. In this way damage from the weather and loss from theft can be prevented. He should be provided with tool boxes so that it is not necessary to take the tools to the tool house if they are to be used in the same place for several days at a time. The habit or practice of leaving tools out all night is

both wrong and unnecessary and should not be allowed.

As has already been said, the old and familiar hand tools are a part of all gang equipments. These include such tools as spike mauls, sledges, track wrenches, lining bars, rail cutters, shovels, forks and picks. The importance of buying these tools under a proper specification as to the kind of metal entering into their manufacture is, of course, realized. It is absolutely necessary that they be strong and rugged, as they must stand a lot of punishment. The foreman has nothing to do with the design, but his duty is to make sure that his hammers, bars and picks get no more rough handling than is necessary and that the faces are frequently redressed. The frequent inspection of all tools by the foreman is of the greatest importance, both from a view of maximum service and also from a safety point of view. Striking faces and cutting edges should be inspected frequently so that any defects that may be developing will be detected. The handles also need close attention to see that they are properly set and in good condition. Many blows are not accurately struck and the danger of accident to the men makes the inspection of handles important.

These tools are all of the simplest kind. Their utility depends very largely on good design and good material and workmanship. To secure the maximum use from these tools it is necessary that the foreman exercise a most rigid inspection so that defects and flaws may be detected in advance of any accident, and also so that the striking faces may be redressed and the cutting edges sharpened before the wear is so great that the tool is destroyed.

Another tool which is in universal use is the track jack. This is really more of a hand than a machine tool and as a consequence it suffers from rough usage and neglect. A track jack is built to get rough treatment and usually has a long life. However, its functions will be performed to much better advantage if it is inspected, cleaned and oiled occasionally.

Within a comparatively short time machine tools have been getting to be more and more a part of a gang's equipment. The pneumatic tamper is a machine which must be taken apart frequently and thoroughly cleaned and oiled. To get the most satisfactory service, the lubricants that are used in machine tampers must be supervised. Black oil and signal oil are not proper lubricants, although they are very common ones. An oil specially suited for these machines should be furnished. Along with the pneumatic tampers have come pneumatic motors. These machines have a wide field of application, but if the machine is to accomplish its purpose it must be maintained carefully. This means that it must be kept clean, be well lubricated and be protected from the weather when not in use. The neglect of simple maintenance results in a short time in a machine which will not work. The inevitable result of such a condition is that the foreman will not use the machine. The above remarks as to the frequent cleaning and oiling of tampers and motors apply to all machine tools.

There are certain means possible by which the proper care of the tools may be made comparatively easy for the foreman. His equipment should include a good grinder with a complete set of attachments for dressing, grinding and sharpening. This does not mean a big grindstone, but a small, high speed machine, easy to operate and by means of which cutting edges of tools can be kept sharp and striking faces kept dressed up. With such a machine a large amount of the work required to keep tools in proper shape can be done by the trackmen on days when the weather prevents work on the track, and in this way many tools can be maintained properly which

otherwise would have to be sent to a shop for repairs.

It should also be arranged so that the foreman is able to get his tools repaired with a minimum of labor and clerical work. A very satisfactory arrangement is a supply car which runs over the division at frequent intervals and makes it possible for the foreman to exchange worn tools at the supply car door for good tools. This arrangement also permits a foreman to carry the minimum amount of equipment. If tools are shipped to a central point for repairs, the work required from the foreman should be kept as nearly as possible to the shipping of the tools and the notifying of the supervisor that certain tools were shipped.

The maximum use of tools can only be attained by close co-operation between the supervisor, the foreman and the trackman. It is the duty of the foreman to see that rough handling is reduced to a minimum and that his tool equipment is well maintained at all times. It is the duty of the trackmen to aid the foremen in the accomplishment of his task and it is the duty of the supervisor to see that good deliveries are made of repaired tools, so that the work does not suffer from lack of tool equipment.

INSTRUCTIONS FOR REPAIRING TRACK TOOLS

By F. H. WATTS

Division Engineer, Pennsylvania Lines, Pittsburgh, Pa.

It is a duty and a war-time necessity to increase the savings obtained from securing a longer life from tools. However, this must not be secured at the expense of output. A recent record showed the cost of small tools and repairs of \$13,614.67 to be only 1.85 per cent of the cost of work totaling \$916,877. The foreman must bear in mind that with the present high labor rates, the time wasted in using poor tools may make the work cost more than with new tools.

The storekeeper or the man responsible for the tool supply can decrease the cost of tools. The stock should be based on the amount of work authorized instead of on former requisitions. Six per cent on \$25,000, not an unusual stock for a large division, is over \$4 a day interest. If proper repair parts are available the stock may be less.

The storekeeper should occasionally inspect the scrap sent in. The ordinary rule requiring an old tool to be shipped in before a new tool is furnished is not always obeyed, and it is desirable to run a "pick-up" train over each division about once a year to collect surplus tools and extra material on hand. The best time to do this is late in the year when forces are low. Instead of picking up the new tools the old tools should be collected so that the storekeeper may put them in good condition for the spring work. The arrangement for storing tools in the section houses should be standardized, and the space for each tool stenciled on the toolhouse wall. One plan used for this purpose is shown in the diagram.

The storekeeper preferably should have direct supervision over the blacksmith who repairs tools, for the greatest saving can be obtained through proper repairs. To secure uniform results, particularly when done on a piece work basis, the instructions given below are necessary, although it is difficult to cover the heat treatment, which is the most important part of the work.

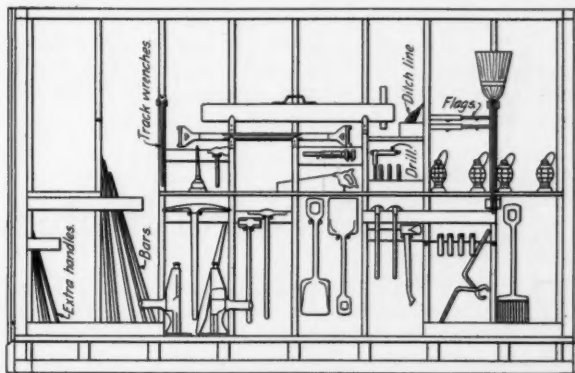
The foreman can decrease the cost of tools by ordering only those needed, and by keeping the tools on hand in good working condition. Before establishing standards, more study should be made of the adaptability of track tools for the work. The design and weight affect the work done. For example, in cleaning stone ballast

the output was increased 60 per cent by changing from a 12-tine fork 11¼ in. wide to an 11-tine fork 9 in. wide, which was better suited to the narrow tie spacing.

Limits of wear should be shown on the standard plan so tools may be scrapped when not suitable. Some may be reworked for other uses; for instance, a worn tamping pick may be made into an economical clay pick.

INSTRUCTIONS FOR REPAIRING TRACK TOOLS

Tool steel for railway tools is manufactured by the crucible process. The ingot first formed is brittle and unfit for use, but the refinement of the grain in the subsequent forging, rolling and heat treatment results in a product which, with care in forging and tempering, will give excellent results. Tool steel should never be heated above a bright cherry red or dull orange, for overheating causes it to crystallize. Tool steel must not be



ONE WALL OF A TOOL HOUSE, SHOWING STANDARDIZED TOOL STORAGE

worked below a red heat because hammer strains will be produced in the metal, resulting finally in the breaking of the tool. A hammer which is too light must not be used, as a light blow merely draws the outer surface of the metal and sets up severe strains between the inner and outer portions of the tool, which also result finally in breaking. Tools frequently fail in service on account of hammer strains or improper forging, whereas the blame is placed on the tempering on the supposition that the tool was too hard. In forging tool steel the temperature and weight of the blow must be so regulated that the metal flows evenly all through the piece.

Care must be taken to see that the tool is heated throughout to a uniform temperature. Tools must not be left in the fire longer than necessary to secure a good heat, as crystallization takes place gradually in the grain of the steel while it remains at a forging heat. Unnecessary heating also produces scale on the surface, which, if not thoroughly removed, results in uneven temper, with a soft spot under each scale particle.

When heating the steel, either in a coke fire or oil furnace, the amount of air supplied should be just sufficient to insure complete combustion. An excessive air blast not only causes scale to form on the surface of the tool, but also has a decarbonizing action and creates a skin of soft metal over the outside which is nearly pure iron, with the carbon removed. If the amount of air is insufficient, so that carbon gases are produced in the fire, there is apt to be a case-hardening action on the surface of the tool, increasing the amount of carbon at the surface. The importance of careful regulation of the fire is therefore apparent. Cutting edges should never be placed directly in the path of the flame, to avoid dan-

ger of burning and of the decarbonizing action above referred to. The tool should be turned in the fire or furnace from time to time to insure even heat and to avoid the distortion which occurs when the heat is all applied to one side of the tool.

For tempering tools, cold running water is preferable. Where this is not available, the tool should be kept in motion while in the tempering bath in order to break the film of steam which forms over portions of the surface. Detailed instructions for tempering various tools will be found in the following paragraphs:

In repairing track chisels, trim off the battered portion of the head and redress the new head. Draw out to approximate shape for a new cutting edge and trim off about one-quarter inch of the old cutting edge to insure the removal of all tortured metal, which would spoil a new cutting edge. Then dress down to a new cutting edge and quench in water until cold. For tempering, heat to a cherry red, dip one inch in cold water and draw to a light purple at the point. Necessary grinding of the head and cutting edge should be done before the chisel is tempered, wherever possible. The heads of track chisels must never be tempered. Track chisels

should not have the cutting edge redressed by grinding, but grinding should be confined to the sharpening of dulled and slightly chipped cutting edges.

Spike mauls should be redressed to proper length and allowed to cool in the air. For tempering, heat to a cherry red, dip $1\frac{1}{2}$ in. in water and draw to a straw color.

In repairing claw bars, redress them to proper shape and allow them to cool in the air. For tempering, heat to a dull red, dip the points two inches in water and draw to a dark blue at the point. When correctly tempered, an old file should just about take hold.

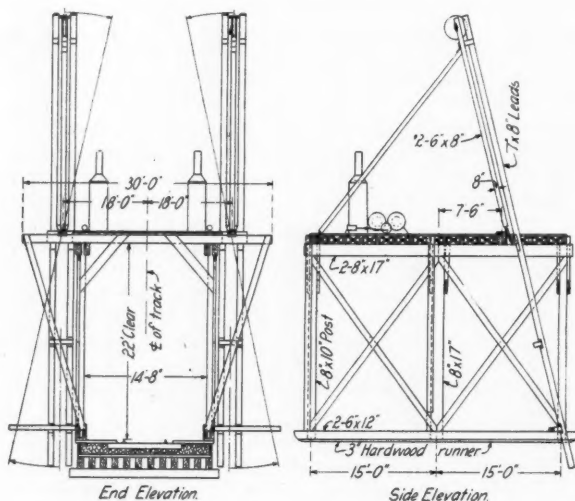
Tamping picks should be redressed at both ends to proper length and allowed to cool in the air. For tempering, heat the tamping end to a cherry red, dip two inches in water and draw slightly, or till the straw color just begins to show. Heat the point end to a cherry red, dip two inches in water and draw to a dark blue at the point.

To repair track wrenches, redress over a mandrel to proper size. Wherever possible, the inside face of the jaws should be case-hardened. For tempering, heat to a dull red, dip the points of the jaws in the water and draw to a dark blue at the points, as for the claw bars.

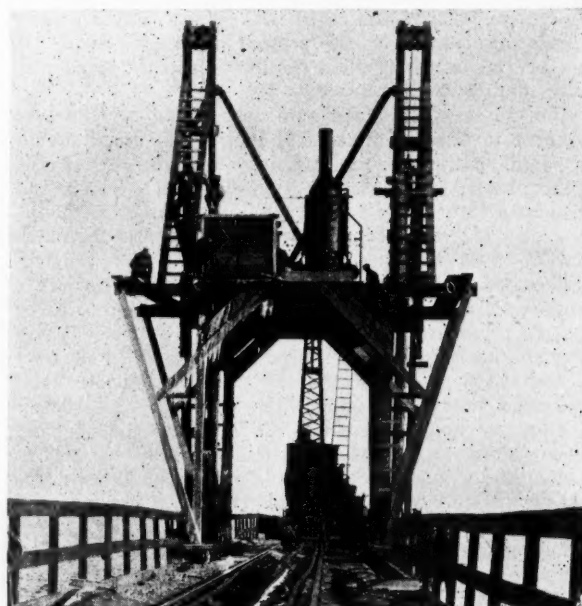
A Novel Problem in Pile Driving.

THE SOUTHERN PACIFIC has recently completed the strengthening of its trestle crossing Great Salt Lake in a manner which gave rise to a number of interesting features. This road crosses Great Salt Lake on a ballasted deck timber trestle 62,790 ft., or 11.9 miles long. The trestle is built for single track with two stations on it, each of which has two passing tracks. The bottom

years. However, during the last few years the size of the freight trains passing over the structure has doubled, while operating arrangements required eastbound freight



DETAILS OF THE PILE DRIVER FRAME



THE DRIVER FROM THE TRACK

of the lake is practically level, with about 40 ft. of water for the entire length of the structure, below which is about 8 to 10 ft. of mud overlying hard bottom.

When the trestle was built originally no longitudinal bracing was inserted because of the belief that the force of the waves might knock the trestle out of line. Because of the deep penetration of the piling and the large number of bents, the structure was sufficiently stiff to make any longitudinal bracing unnecessary for several

trains to take a siding at the middle of the lake when meeting opposing trains. The constant stopping and starting of the trains in the vicinity of these switches on the trestle led to the decision to install brace piles inclined against the direction of movement to take up the thrust.

This bracing has been installed for a distance somewhat greater than the average train length at each point. The brace piling are about 90 ft. long and were driven

with a batter of three inches to the foot. They were driven along side the deck and were then pulled in and fitted against the existing piling in the bents. No particular difficulty was experienced in drawing the piling in, as the maximum pull was 4 ft. and the distance through which the piles could be sprung was 60 ft. from the trestle cap to the hard bottom.

Because of the frequency of train movements and the fact that there was a train at some point on the trestle almost all of the time it was impossible to drive these piles with an ordinary track driver. A floating driver



A SIDE VIEW OF THE TRAVELER FROM THE WATER, SHOWING THE DRIVING APPARATUS

was likewise out of the question because of the sudden storms on the lake and the fact that there was no shelter within 12 miles of the point where the piles were to be driven.

This condition was met by the construction of a gallows frame over the track in a manner to provide sufficient clearance for trains and carrying on its upper deck a platform with a hoisting engine which furnished steam to two steam hammers, driver leads and other necessary equipment as shown in the drawing. This machine was carried on small rollers so that it could be moved on the deck plank of the trestle as the work progressed. Two piles were driven at a time. Several hundred piles have been driven with this apparatus at a large saving in cost over that of ordinary machines, while the work was also expedited greatly owing to freedom from train movements.

This machine was designed and the work carried out under the direction of George W. Rear, general bridge inspector of the Southern Pacific, Pacific System.

SPECIFICATIONS FOR TIE PLATES AND BEARING METALS

AT THE CONVENTION of the American Society for Testing Materials, which was held at the Hotel Traymore, Atlantic City, N. J., on June 25-28, specifications were presented for bronze bearing metals for turntables and movable railroad bridges, and the specifications for steel tie plates presented a year ago were revised. The regrading of railway bearing metals brought out a lively discussion as to the maximum percentage of impurities that should be allowed, the table of chemical composition submitted by the committee being finally accepted. The following are abstracts of the more important changes in these specifications which are of interest to railway men, those portions treating of administration matters relative to inspection, tests, etc., being omitted:

PROPOSED SPECIFICATIONS FOR BRONZE BEARING METALS FOR TURNTABLES AND MOVABLE RAILROAD BRIDGES

These specifications cover four classes of bronze-bearing metals for turntables and movable railroad bridges.

The purposes for which these classes are frequently used are as follows:

Class A, for contact with hardened steel disks under pressures over 1,500 lb. per sq. in., for example, bearing metals, used in turntables and center-bearing swing bridges;

Class B, for contact with soft steel at low speeds under pressures not over 1,500 lb. per sq. in., for example, trunnions and journals of bascule and lift bridges;

Class C, for ordinary machinery bearings;

Class D, for gears, worm wheels, nuts and similar parts which are subjected to other than compressive stresses.

The bronze shall be a homogeneous alloy of copper and tin. The copper shall conform to the requirements of the standard specifications of the American Society for Testing Materials. The bronze shall be made from new metal, except that scrap of known composition produced by the foundry at which the bronze is cast may be used.

Care shall be exercised that the metal is not overheated, and that the temperature at pouring and the conditions of cooling are such as will be most likely to secure dense castings.

The bronze shall conform to the following requirements as to chemical composition:

Elements considered	Class			
	A	B	C	D
Copper, per cent.....	Remainder	Remainder	82 (max.)	89 (max.)
Tin, per cent.....	about 20	about 17	11	11
Lead, per cent.....	.....	.....	about 10	.....
Zinc, per cent.....	.....	.....	.....	2.25 (max.)
Iron, per cent.....	.....	.....	.....	2.25 (max.)
Phosphorus, per cent..	not over 1.0	not over 1.0	0.7-1.0	.....
Other elements, per cent.....	not over 0.5	not over 0.5	not over 0.5	not over 0.5

The bronze shall conform to the following requirements as to compressive and tensile properties:

Properties considered	Class			
	A	B	C	D
Compression				
Deformation limit, lb. per sq. in.....	25,000-40,000	19,000-23,000	12,000-17,000	about 14,000
Permanent set in 1 in. under 100,000 lb. per sq. in., in.....	0.06-0.10	0.12-0.25	.....	.....
Tension				
Yield point, min., lb. per sq. in.....	.....	.....	.....	15,000
Tensile strength, min., lb. per sq. in.....	.....	.....	.....	30,000
Elongation in 2 in., min., per cent.....	.....	.....	.....	14

The deformation limit in compression shall be determined as that load which produces a permanent set of 0.001 inch in the compression test specimen.

The yield point in tension shall be determined as the stress producing an elongation under load of 0.5 per cent—that is, 0.01 in. in a gage length of 2 in.

A test bar of the form and dimensions shown (0.57 in. diameter for a length of $2\frac{3}{8}$ in.) to be used for the tension test specimen, and a suitable test bar for the compression test specimen, shall be an integral part of the casting, and shall be fed and cooled under the same conditions as were the castings.

Compression test specimens shall be cylinders 1 sq. in. in cross-sectional area and 1 in. high.

Tension test specimens, turned from the test bar, shall be $\frac{1}{2}$ in. diameter for a length of $2\frac{3}{4}$ in. The ends shall be of a form to fit the holders of the testing machine in such a way that the load shall be axial.

The castings shall be sound, clean, and free from blow-holes, porous places, cracks and other defects.

SPECIFICATIONS FOR STEEL TIE PLATES

Revised specifications for steel tie plates were submitted which differ from those presented last year in regard to chemical properties and physical tests. The paragraphs as to chemical properties are given in full below.

The steel shall conform to the following requirements as to chemical composition:

	Bessemer	Soft grade	Medium grade
Carbon, per cent.....	not under 0.06	not under 0.12	not under 0.12
Phosphorus, per cent.....	not over 0.10	not over 0.10	not over 0.10
Open-hearth			
Carbon, per cent.....	not under 0.12	not under 0.20	not under 0.20
Phosphorus, per cent.....	not over 0.06	not over 0.06	not over 0.06

A carbon determination shall be made of each melt of Bessemer steel, and two analyses every 24 hours representing the average of the elements carbon, manganese, phosphorus and sulfur, contained in the steel, one for each day and night turn respectively. These analyses shall be made from drillings taken at least $\frac{1}{8}$ in. beneath the surface of a test ingot obtained during the pouring of the melts. The chemical composition thus determined shall be reported to the purchaser or his representative, and shall conform to the requirements specified in the table.

An analysis of each melt of open-hearth steel shall be made by the manufacturer to determine the percentages of carbon, manganese, phosphorus and sulfur. This analysis shall be made from drillings taken at least $\frac{1}{8}$ in. beneath the surface of a test ingot obtained during the pouring of the melt. The chemical composition thus determined shall be reported to the purchaser or his representative, and shall conform to the requirements specified in table.

An analysis may be made by the purchaser from a finished tie plate representing each melt of open-hearth steel and each melt or lot of 10 tons of Bessemer steel. The carbon content thus determined shall not be less than that specified in the table and the phosphorous content shall not exceed that specified in the table by more than 20 per cent.

The innovation concerning the physical properties lies in the elimination of all reference to tensile tests and the method of making them. Instead bending tests are required as given in detail below.

The bend test specimens shall bend cold through 180 deg. around a pin the diameter of which is equal to the thickness of the specimen for the soft grade, and to twice the thickness of the specimen for the medium grade, without cracking on the outside of the bent portion.

Bend test specimens shall be taken from the finished tie plates, or from the rolled bars; and longitudinally with the rolling. They shall be rectangular in section, not less than $\frac{1}{2}$ in. in width between the planed sides, and shall have two parallel faces as rolled. They shall be free from ribs and projections. Where the design of

the tie plates is such that the specimen cannot be taken between the ribs or projections these ribs or projections shall, in preparing the specimen, be planed off even with the main surface of the tie plate.

If preferred by the manufacturer and approved by the purchaser, the following test may be substituted:

A piece of the rolled bar shall bend cold through 90 deg. around a pin the diameter of which is equal to the thickness of the section where bent for the soft grade, and to twice the thickness of the section where bent for the medium grade without cracking on the outside of the bent portion.

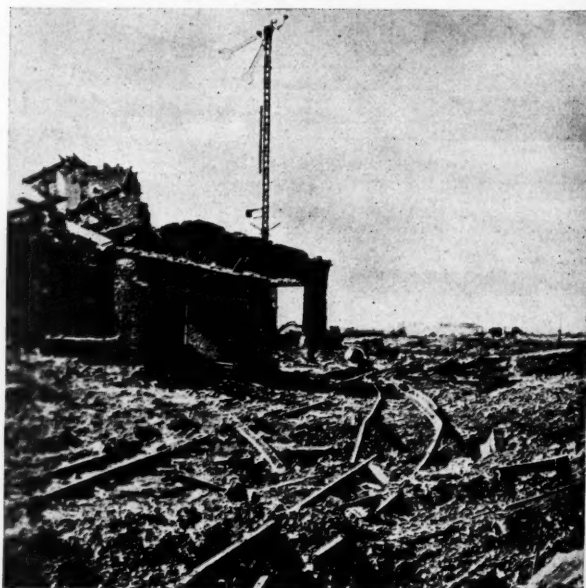
One bend test shall be made from each melt of open-hearth steel, or from each melt or lot of 10 tons of Bessemer steel.

If any test specimen shows defective machining or develops flaws, it may be discarded and another specimen substituted.

THE RAIL SITUATION

Some of the railroads that have increased the weight of section, particularly where this is decidedly over 100 lb. per yd., report the greatly reduced cost of track maintenance and a reduction in the number of failures as well as better riding track. One of these roads now has in contemplation a section weighing 200 lb. per yd. While the weight of section may be extreme and only to be considered by roads having extremely dense traffic and the heaviest wheel loads, the tendency toward heavier sections seems to be general.

From time to time experiments have been made in the quenching and annealing of rails sometimes of standard sections and sometimes of sections slightly modified to better meet the stresses incident to quenching. The rails when put in service generally showed markedly greater resistance to abrasion, but some failed due to brittleness in track. There are now in track, at points where the service is particularly severe, quenched and annealed rails which have not proven brittle, although they carry very heavy traffic under severe service conditions on heavy curves. The results of these tests indicate that the heat-treated rails may have a future.



WHAT SHELL FIRE DOES TO TRACK WORK

ACTIVITIES OF THE RAILROAD ADMINISTRATION

Abstracts of Orders Issued by the Director-General and the Regional Directors. Wage Data Requested

DIRECTOR GENERAL McADOO has been in California most of July resting and recovering from a recent attack of laryngitis which has affected his vocal chords. He has utilized this opportunity to familiarize himself with conditions on the railways along the Pacific coast.

Late in June R. S. Lovett, Director of the Division of Capital Expenditures, approved additional budgets, bringing the total, including equipment, up to \$971,780,739.

WAGE MATTERS

In P. S. & A. Circular No. 14, dated July 9, C. A. Prouty, director of the Division of Public Service and Accounting, instructions were issued that the entire amount of back pay due employees in accordance with the award of the Wage Commission shall be included in the accounts for June, 1918.

INCREASED RATES FOR TRACK LABOR

R. H. Ashton, regional director of the Northwestern region, has issued Supplement No. 7 to Circular No. 63, under date of July 8, increasing the maximum rates of pay for track laborers in that area as follows:

"Effective at once a maximum rate of 30 cents per hour for track labor outside of the Chicago terminal district is hereby authorized where considered necessary in addition to districts named in Supplement No. 5 to Circular No. 63, with the understanding that before increase is made over and above the rates now in effect lines interested in same districts must be notified and a report made to the regional director, specifying the date the increase will be made effective and naming the limits of the district to which it applies."

Owing to the unrest which is evident among supervisory forces, such as foremen, by reason of discrepancies created in rates of pay under the application of General Order No. 27, the regional directors have asked the roads to prepare and forward to them statements of specific cases on their lines where readjustments of pay may be considered necessary. In the maintenance of way department information is requested for such employees, giving the title, location, rate paid prior to General Order No. 27, present rate, recommended rate and reasons why the increased rate is necessary. The order further states that in case of inquiry it is proper to make it known that this matter is now under consideration with a view to prompt adjustment.

WAGE QUESTIONNAIRE

The Board of Railway Wages and Working Conditions has prepared and sent to the roads a questionnaire relative to labor conditions in the maintenance of way department containing the following questions:

1. Do you employ common labor by the day or by the hour? Specify hours per basic day.
2. Give range of pay per hour, approximate number employed at each rate, and reason for any differential that may have existed in December, 1915, or exists today.
3. Give approximate corresponding rates paid in other industries in that proximity.
4. At what rate is overtime paid for, night work, Sundays and holidays as of this date?
5. What proportion of this force is paid on the piece work basis?
6. What was the rate per basic day or hour for piece workers prior to January 1, 1918?
7. What was the average, maximum, minimum and prevailing piece work hourly earning in 1917?

8. Do you recommend that continuance or introduction of piece work on track maintenance?

9. Describe conditions of supply of common labor sufficient to give comprehensive grasp of the situation.

10. What rates do you recommend be paid to obtain an adequate supply of common labor?

11. If such rates are paid, will they withdraw labor from essential war industries or from non-essential industries, or will they induce itinerant labor to work?

12. What minimum differential (expressed in per cent) over usual monthly earnings of common labor would be paid for foreman?

EXPEDITING LUMBER DELIVERIES

The Regional Purchasing Committee of the western railroads issued Circular No. R. P. C. 17 on July 6, announcing the appointment of O. H. Wood as special representative of the Central Advisory Purchasing committee, Forest Products Section, with office at Seattle, Wash., to assist in procuring railroad requirements for fir timber. The order states that "he will work through the Fir Production Board in the allocation of new orders and delivery on old orders. Roads which are unable to place orders for fir timber and lumber at not to exceed the government price, should send their orders in triplicate to this office and we will arrange for their placing. In the case of old unfilled orders, on which you are unable to secure delivery, send this committee a copy of the order in triplicate, showing only the unfilled portion and give full particulars as to where and with whom placed and the price. We will take the matter up with a view of facilitating movement of the material."

TESTING TRACK SCALES

In Circular No. 13, C. R. Gray, director of the Division of Operation, issued the following instructions with reference to testing railway track scales:

"The duly authorized representatives of the Bureau of Standards, Department of Commerce, with the scale-testing equipment, test weights and testing apparatus of the Bureau of Standards, shall have access to master track scales, track and other scales, and to test cars owned by the railroads for the purpose of testing scales and calibrating test cars in order that the Bureau of Standards may obtain all necessary data and information upon which to reach a proper conclusion as to suitable specifications and tolerances for the various classes of scales and weighing devices when under test and when in practical operation, and as to suitable methods of testing scales and calibrating scale test cars and master track scales."

"Reports of these tests and calibrations with recommendations shall be made by the Bureau of Standards to the interested railroads and regional directors, currently as the tests are made."

REPORTS ON ADDITIONS AND BETTERMENTS WORK

Under date of June 22 the director of the Division of Capital Expenditures issued Supplement No. 1 to D. C. E. Circular No. 1, amending the original instructions relative to returns on Additions and Betterments work to provide that (1) The monthly report to be made on D. C. E. form No. 2 is to embrace projects involving a charge to Capital Account of less than \$1,000 instead of \$5,000, as required originally, beginning with July, 1918. (2) The minimum amount to be reported on D. C. E. form No. 3 is to be reduced from \$5,000, as originally fixed, to \$1,000, so that the projects to be reported on this form shall be those involving a charge to Capital Account of not less than \$1,000 nor more than \$25,000. (3) A monthly report of all work authorized during the month involving a charge to Capital Account of less than

\$1,000 for each project or job should be made on D. C. E. form No. 6, grouped by classes of work showing location, general description and the amount chargeable to Capital Account only.

INROADS OF THE DRAFT ON RAILROAD MEN

Owing to the serious inroads which the selective draft is making upon railway employees on a number of roads, the following circular letter has been sent to the railroads:

"You will recall that we were previously assured of the intention of the Provost Marshal General to have skilled and necessary railroad employees placed in Class II, and reserved to be drawn upon only as the exhaustion of Class I required it, or to supply the necessary skilled men for the operation of military railways. Those concerned were notified of this understanding in order that it might be generally known, and with the hope that it would largely protect the skilled and necessary employees against being drafted for general military service, and instead, reserve them for their work on the railroads, which is of such great importance to the conduct of the war.

"Unfortunately some of the district boards which have jurisdiction over the matter of industrial classification, without any provision for appeal in any ordinary case so far as the existing regulations go, did not carry out this understanding, or were not broad in their construction of what sort of work should be included in skilled and necessary railroad employment. The result was that a large number of men who were considered skilled and necessary railroad employees have been placed in Class I.

"The names of such men sent in by you have been tabulated and arrangements made for presentation of the recapitulation to the War department, with the hope that there may be a reclassification in the office of the Provost General, which will place many of these men in Class II, or some other deferred class.

"We cannot, however, undertake to take up individual cases as the men are called for service. In event a man who is a skilled railroad employee is called for service, and you will notify me as soon as possible after his call, giving the name of the man, the nature of his railroad work and experience, his order and serial numbers, the location of his draft board, the place at which and the date on which his orders call for him to report, I will endeavor to make arrangements to have him assigned to military railway service. If this is done, it will, to that extent, lessen the call upon other skilled railroad employees who might be drafted for military railway service.

"It is perhaps well to repeat what I have heretofore written to some of you, namely, that if you hear of any cases where skilled railroad men have actually been placed into ordinary military service, I should be advised so as to try to get them into military railway service. I understand arrangements have been made to have the skilled railroad men who are called under the selective draft law sent to Camp Benjamin Harrison, and kept together to avoid their being placed in ordinary military service through error.

"It is not anticipated that the men who have been classified in Class II will be called, except as it may become necessary to do so to fill places in the military railway service, for which men cannot be found among those who are already in military service, or who may be drafted from Class I."

VALUATION EXPENSES

The question has been raised regarding the extent to which the government will permit the payment of expenses incurred in the valuation department of the roads from operating funds. To settle this, C. A. Prouty, director of the Division of Public Service and Accounting, and also director of the Division of Valuation, issued P. S. & A. Circular No. 10, June 29, stating that whatever expenses may be necessarily incurred by carriers in making the valuation which is now being made by the Interstate Commerce Commission, may be charged to operating expenses under federal control, but that the director general will not pay expenses incurred to test the accuracy of this valuation or to test it before the commission or the courts. The circular states that this valuation is of great importance to the corporation and it is entirely proper that the corporation should assure itself of its correctness, but that it is also manifest that

the corporation and not the director general must determine the manner and extent of all this and that it should decide the amount of the outlay necessary to test such correctness and pay it.

In the application of this rule the following classes of expenditure will be borne by the director general as an operating cost:

1. Whatever is necessary to comply with the valuation orders of the Interstate Commerce Commission.

2. Whatever is necessary to prepare and furnish the information required by the Bureau of Valuation. This includes requirements by its employees who are conducting the valuation in the several districts.

3. Whatever may be necessary to co-operate in the field by the furnishing of men to point out the property of the company, to assist in the taking of the inventory, etc.

4. For computers when, and only when, they work with the computers of the Bureau of Valuation or under its direction, or on the preparation of data required by the Bureau of Valuation.

5. For land appraisers, provided they proceed in the same general manner as the appraisers of the commission in the collection of facts and opinions bearing upon the value of the lands to be appraised, and provided further that they will, after such information is accumulated, exhibit the same to the employees of the Bureau of Valuation in an effort to agree upon reasonable values. Expenses for expert opinions will not in any case be paid for.

6. When the field work of the Bureau of Valuation in any branch has been completed no further outlay by the carrier for account of the director general in respect of that branch will be paid for and charged to federal operation without special authority obtained from this office.

The above rules will apply as of July 1, 1918, and thereafter, leaving open for further consideration and instruction the six months then already elapsed.

In accordance with the requirements of the Act of Congress authorizing the taking over of the control of the railroads by the government, which required it to return to their owners before July 1, 1918, control of those roads which it did not desire to retain, the Railroad Administration relinquished a large number of short line and switching roads on June 29. Although it has not made public a list of the roads returned to their owners, it gave out a supplemental list of 395 railroads over which government control was continued on July 3. Including the 165 roads originally taken over, the government is now operating a total of 560 railroads, a large number of which are terminal, union station and switching lines or other subsidiaries. The total mileage of roads now under government control is 230,000.

A. R. E. A. COMMITTEE WORK

THE AMERICAN Railway Engineering Association has just announced the personnel of committees and the subjects assigned to them for next year's work. Owing to the fact that many of the subjects assigned require more than one year for their proper consideration and also to the requirements of the association that not more than two topics can be reported for action in any one year, many of the subjects assigned are carried over from last year. Among the new subjects which have been given to the committees for investigation during the present year are the following, which are of particular interest to maintenance of way men:

Ballast—Study and report on the design of gravel washing plants; study and report on the design of stone-crushing plants.

Buildings—Report on detail designs of buildings used for housing track labor. Report on the efficient and economical methods of electric lighting of (a) Passenger station interiors; (b) Passenger station surroundings; (c) Platforms, covered and uncovered. Report on modern types of toilet facilities at small stations where water supply and sewers are lacking.

Wooden Bridges and Trestles—Report on classifications and grading rules for all lumber and timber used in the construction and maintenance of way departments of railways. Report on

specifications for construction timbers and building lumber. From these studies draw up in unified form a set of specifications for construction timbers and building lumber for use on railways, showing each kind and quality of lumber or timber which is suitable for each of the different classes of work on a railway. Report on specifications for timber which is to be treated with a preservative substance.

Masonry—Report on different methods of depositing concrete under water. Report on the disintegration of concrete and the corrosion of reinforcing material in connection with the use of concrete in sea water. Prepare specifications for slag aggregate. Report on (1) the effect upon the strength and durability of concrete not having a sufficiency of moisture present throughout the period of hardening as compared with concrete fully supplied with moisture; (2) methods of providing moisture during this period; (3) remedy for concrete hardened with insufficient moisture.

Records and Accounts—Report upon forms for analyzing expenditures for assistance in controlling expenditures.

Rules and Organization—Prepare rules for the construction, maintenance and operation of buildings and protective apparatus for the reduction of fire risk. Prepare rules for the inspection of bridges and culverts.

Water Service—Report upon plans and general specifications for typical water station layouts. Study locomotive flue failures which may be due to improper water conditions and report upon methods of treatment to correct such conditions.

Iron and Steel Structures—Report upon the use of plastic

compounds for the protection of steel work exposed to the blast action from locomotive stacks. Report on the design, length and operation of turntables. (a) Report specifications for the design of turntables and turntable pits. (b) Report specifications for metal for turntable roller and disc bearings. Report on principles for detailed design of flashing, drainage and reinforcement for waterproofing purposes. Report on track scales superstructures.

Wood Preservation—Report on preservative treatment for Douglas fir. Report on indicators for determining the Burtinizing of ties and timbers.

Economics of Railway Operation—Report on methods for increasing the capacity of a railroad. Report on the effect of speed of trains upon the cost of track maintenance. Report upon the allocation of maintenance of way expenses to passenger and freight service. Report on the reclamation and utilization of scrap material.

Economics of Railway Labor—Report on plans and methods for organizing to obtain labor for railways. Report on methods of equating track sections. Report on typical plans for boarding cars and boarding houses for railway laborers. Study the matter of establishing proper relations between a unit of track expenditure and a unit per mile of line for different classes of road for the purpose of determining a normal maintenance expense and to obtain, as far as possible, uniform conditions involving: (a) Separation of expenses as between road, signal and bridge and building departments. (b) Determination of ratio of labor cost to total cost. Report on labor-saving devices.

They're Sure Bone-Heads

BY M. O. WAY

DAN MARTIN, MASTER CARPENTER, was sitting at his desk. He did it well; in fact, some said it was one of the best things he did. Whether this opinion was prompted by a contemplation of his 200 lb. of solidness concentrated in a total height of 5 ft. 4 in.,



"TELL MCGREGOR I'LL GO ALONG"

or by the fact that he could get more work done at one "sitting" than any two men on the division, depended entirely on the point of view. But Martin was by no means an office man, he managed to get around to see what his foremen were doing, although he did it with an absolute minimum of lost motion. These slow moving characteristics of Martin had been a source of "nerves" to Brown, the engineer maintenance of way, when the latter came with the road a year before, but try as he would he was never able to trip Martin up, for Dan was right on the job all the time. Moreover, he had since advanced rapidly in Brown's esteem.

Dan's thoughts were disturbed by the entrance of Bill Schwartz, his youthful but long-legged clerk, who came in from the station with a bunch of mail, and folded himself upon a chair which had been adjusted as far as possible to his elongated dimensions with the help of two glass insulators on the back legs and a folded caboose cushion on the seat. As he hurriedly tore open the yellow R. R. B. envelopes he glanced at them and passed them over to Martin, who read them deliberately.

"Well, those fellows do sure work their graft to the limit," said the latter after some moments of study. "Look at what the mechanical department is charging us for that last order of drift bolts, 50 per cent more than they cost on the open market."

"I thought you were going to take that up with Mr. Brown?"

"So I did, but that's all the good it did me. He agreed with me from start to finish, smiled and said we'd have to make the best of it. I guess he got it so strong from the 'chief' that he knows when to keep still. So I'm through, too. But I do hate to sit here and see them load up a lot of their motive power expenses on the stuff they turn out for us. The worst of it is, they can't do things right. Every time we ask for anything the least bit out of common, why they get it all mixed up."

A further discussion of this subject was interrupted by a long blast on the roundhouse whistle, followed by three more.

"Another smashup!" volunteered Schwartz, as he pushed back his chair and ran to the window, threw up the sash and looked out across the grid of tracks that lay between the station and the engine terminal.

"See anything of McGregor?" said Martin, who had remained seated. "If you don't you better go in to the despatcher's and see what it is."

Schwartz, who was only too anxious to go, left the room and was not long in bringing back the news.

"It's 86, four or five cars in the middle of the train piled up, down at the bottom of the hill below Mayville."

"Anybody hurt?"

"Guess not."

"Did they hit the bridge?"

"They didn't say."

"Well," said Martin decisively, "I guess I'd better go long and see if they did any damage. Run down and tell McGregor I'll be right along." He rose ponderously, pulled his hat forward on his head and followed his clerk deliberately out of the room and down the stairs. He crossed the main tracks in front of the station and the 4 or 5 yard tracks beyond and reached the "rip" tracks where the wrecking equipment stood, just as the conductor came back to notify McGregor, the wrecking foreman, that he was ready to go. However, the master carpenter had time to tell his clerk that he would be back on train No. 21 if they had the track clear in time to let her through.

It was five o'clock, 1 hr. and 20 min. past her regular time, when No. 21 pulled in at the station, and Schwartz, leaning way out of the office window, as he always did when a train was at the station, saw Brown and Martin drop off the rear end and come toward the office. Brown was in advance as they came in the door and as the other followed, panting, and slid into his chair with a sigh of relief, he turned toward his clerk. "Well, Bill, we got off easy that time; the bridge was hardly scratched, although six cars rolled down the dump just the other side of the bridge."

"But, Dan," interrupted Brown, "are you sure that the damage is limited to those lacing bars?"

"Yes, Mr. Brown," replied Martin. "I inspected the bridge thoroughly. Several of the floorbeam gusset plates were dented where the derailed car hit them as she bumped along on the ties, but the only real damage is those three lacing bars tore off the second post from the east end of the span on the north truss. As I told you coming in, that young engineer of yours, Radcliff, was down there, and he measured up the bars and said he would make a sketch for me to order new ones."

"Well, we want to get them right away," said the other. "Those posts are compression members and with that span stressed up as it is we can't take any chances, Dan. Put on a slow order right away and don't take it off until the bars are replaced."

"Yes, I'll do that; and, by the way, don't you think I'd better get those bars from the Valley Bridge Company? I know those fellows pretty well and they'll know exactly what we want and get the job done quick, too, and you bet it will be right."

"Dan," returned Brown, "you have been here longer than I have and you know as well as I do what the company's policy is about ordering such stuff outside. No. We'll have to order that through the storekeeper, to be made at the shops."

"Well, they won't get it right, and they will sure soak it to us in the bill," was the master carpenter's reply.

"But, Martin, it's so simple, there's nothing to it at all; any boy could make those bars. Here is Radcliff now. Let's see what you've got there, Frank."

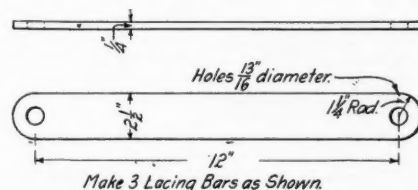
The assistant engineer, who had just entered the room, handed him a small sketch showing a detail of the bars required.

"Well," commented the engineer maintenance of way, "that's all clear enough. Look at that, Martin; if any mechanic can't make out what is wanted from that drawing, I'll eat my hat."

The master carpenter looked over the drawing carefully, scratched his head and then turned toward his superior. "It's all right, Mr. Brown; anybody but a bonehead would understand it, but I tell you they put boneheads on the work they do for us. I know that our en-

gines are kept up as well as they are on any road in the country, but they don't give a tinker's dam about the work they do for us. I don't want to seem bullheaded and I suppose we got to have them do the job, but I've got a hunch that they'll get it wrong."

His superior laughed. "After some of your experiences I suppose you have grounds to feel as you do. Let



me know about these bars when you get them. Now make it rush. Have them shipped by baggage, P. D. Q."

Four days later Bill came into the office with a well-wrapped package, which he laid on Martin's desk, saying, "This must be them bars you got coming."

"Well, they sure must a thought they were delicate to wrap 'em up that way," he replied, as he laboriously loosened the string and unwrapped the paper. Bill was looking at Dan when the contents of the package was finally disclosed to view. He saw Dan's eyes fairly pop out of their sockets, while his round face, which was always more or less red, took on almost a purple hue. Massive bodies move slowly and Dan was no exception to this rule. He continued to look at the package for some moments before he regained his speech, but he made up fully for this delay by the vigor of his well chosen words, of which any switchman would have been justly proud.

But the storm was soon over.

"Ain't that the limit?" he said. "There they are, three of 'em, just as we ordered, 2½ in. wide, ¼ in. thick, holes exactly 12 in. centers, and 13/16 in. diameter, and they did a good, neat job, too. Only they made 'em out of leather."

THE ROADMASTERS' CONVENTION

PLAN FOR THE thirty-sixth annual convention of the Roadmasters' and Maintenance of Way Association, which will be held at the Auditorium Hotel, Chicago, on September 17-19 inclusive, are developing rapidly. The meeting this year will be thoroughly business-like in character throughout with the keynote—"keeping the tracks in proper condition as an aid in winning the war." All entertainment features will be eliminated and the annual banquet on Wednesday evening will be replaced by a war dinner, at which a number of prominent railway men will speak on the problems confronting the maintenance of way department. The tentative program for the convention is as follows:

FIRST DAY—MATERIAL DAY

Opening Exercises.

President's Address.

Report of Committee on the Reclamation of Track Materials.

Discussion, with individual papers on same subject by officers of several leading railways.

SECOND DAY—LABOR DAY

Round Table Discussion of Labor Conditions.

Address—What the government is trying to do for the railway track labor situation—by a representative of the United States Department of Labor.

Report of Committee on Labor Saving Devices.

Paper—Methods of Purchasing and Inspecting Ties and the Outlook for Adequate Tie Supply.

Paper—The Rail Situation.

THIRD DAY

Committee report—Best Methods of Raising Track.
Business session, Election of Officers, etc.

Plans for the exhibit of the Track Supply Association, which will be presented in a room adjoining the conven-

tion, are equally encouraging. Nearly 40 firms have already arranged for space and other reservations are being received daily. The manufacturers will lay special emphasis upon those tools and devices which are of special interest under existing conditions.

Delay in Maintenance Work Becoming Serious

RAILWAY MEN responsible for the maintenance of tracks and structures are showing much concern over the lack of progress being made in the normal repair of the roadway this year. The four best months of the season are now gone, with far less than the normal amount of work completed.

With the harvest season at hand and with the promise of record-breaking crops this year the demand for labor from this direction will be even greater than usual, and the high wages which are being offered will deplete track gangs more completely than even in past years. By the time the harvesting will be finished and these men return to the track the season will be so far advanced that it will be necessary to concentrate efforts on the closing of the work and the preparation of the track for the winter.

Another factor contributing to the seriousness of the situation is the shortage of ties and rails, the two basic materials used in the largest quantities in track maintenance. Following the taking over of the control of the roads by the government, notice was issued that the central purchasing bureau would order all rails. Since that time no orders for rails have been placed either by the roads or by the government.

While the average condition of the rails in service has declined during the last few years, this is not universally true. A number of roads have been able to keep their maintenance up to normal and on such lines it is possible to go without rails or to do with greatly reduced tonnages this year without serious results. However, up to the present time little attempt has been made to distribute the rails now being rolled to those roads most in need of them and as a result some of the lines which are now in the best condition are receiving rails not because they are sorely in need of them, but because of their foresight in placing orders two years ago. If the output of rails is to be limited, and it would seem that the national situation now warrants this action, it would appear to follow as a necessary step that some comparison of the different roads be made whereby it would be possible to distribute the rails where most needed.

This would mean filling orders already placed in some instances and in placing new orders with precedence over old ones in other cases. In determining which roads should take precedence in the delivery of rails, consideration should be given not only to the present condition of the rails in track, but also to the traffic now moving over them, and that which may be expected to pass over them in the next few months. In many instances rail which is now in fairly good condition, but which is bearing a heavy traffic, cannot be carried over another year with as great a factor of safety as poorer rail which is carrying less traffic and subjected to relatively little wear. This condition was found in Canada recently, where some of the best maintained roads normally were found to be most in need of rail because of the heavy traffic which they were carrying.

The renewal of ties has also been delayed by a shortage of supplies on many roads. Early in the spring the

government issued orders that the roads could buy ties only along their own lines and at prices not exceeding those paid last year. Where ties could not be secured in this way the government announced that it would arrange to purchase them. While this order was issued so late that it had little effect this year on the roads using treated ties, or with contracts already placed, it has shut off supplies for other roads dependent on this spring's purchases, owing to the delay in the perfecting of the government's purchasing organization. This has been accentuated by the shortage of labor in the tie-producing districts, which condition alone would have led to a reduced supply. While the early shortages which existed on a number of roads early in the season have been relieved considerably by delayed deliveries, the time lost by the track forces in placing them in track cannot be made up.

Because of the importance of this subject of adequate maintenance to all railway men, and also because of its direct bearing on the efficiency with which the railways can be operated during the next winter, we have addressed a letter of inquiry to a number of representative roads throughout the country asking specific questions about conditions on their line and in the territories traversed by them as of June 1. These questions and abstracts of some of the replies are given below.

THE AMOUNT OF MAINTENANCE WORK ABOVE NORMAL

(1) How does the amount of maintenance work scheduled for this season compare with that of normal years?

Our replies to this question indicate that the amount of work scheduled for this year is equal to or in excess of that for recent years, as is evident by the following abstracts of replies:

"Maintenance work required this season to reach and preserve normal conditions is considerably more than in normal years owing to the deferred maintenance of the last two years."

"The amount of maintenance work scheduled for this season is practically the same as we have scheduled for the past three or four years."

"The amount of maintenance work scheduled for this year is approximately 5 per cent in excess of that of normal years."

"Our maintenance schedule this year considerably exceeds that of any carried out during recent years."

"The amount of maintenance work scheduled for this season is nearly normal, except in the matter of ballast. The ballast program is reduced to about 60 per cent."

MAINTENANCE WORK BADLY DELAYED

(2) Is it advanced as far as normally at this date? If not, what are the present factors contributing to the delay?

"Our maintenance work this year is far behind normal years. This is entirely due to lack of labor."

"The one thing that can help us out materially is to secure labor of some kind from some source. If some arrangements could be made to let the Mexican, Jap and Chinese labor into the western part of the United States in considerable numbers we could no doubt carry on the work satisfactorily."

"We are considerably further advanced with our tie renewals than in former years, because of our ability to secure men early in the season. We have endeavored to take advantage of this condition while the men are available, as we believe that this

condition will not continue throughout the season. It may be necessary to curtail our ballast program somewhat because of labor conditions later in the season."

"On our bridge work the amount of work performed is about normal. On our tie renewals the work performed is about normal on one-half of our system, but below normal on the remainder on account of a shortage of labor in that territory. Our ballasting is below normal, principally due to lack of power."

"Our program is not as well in hand as it might and should be, due to many causes, but principally on account of the uncertainty brought about by conditions and the inability to secure materials at such a time as will best answer all purposes."

"The progress made to date is about 20 per cent less than normal at this time of year, the governing factor being the shortage of labor."

ADEQUACY OF MAINTENANCE FORCES

(3) To what extent are your maintenance of way forces below normal?

Practically all of the roads replying reported that they were from 5 to 50 per cent short of their normal maintenance forces at this season of the year, as is indicated by the following abstracts:

"Our maintenance forces at this date are fully 30 per cent below normal, with a probability of their falling to as low as 50 per cent of normal as the season becomes further advanced."

"Our maintenance-of-way forces on one-half of our system are about normal, while on the other half they are about 10 per cent below normal."

"During the month of April, one of the best working months in this territory, the maintenance forces were 15 per cent below normal in number and a much heavier percentage below normal in efficiency."

"With the exception of one or two short stretches of territory, our labor forces are filled up to normal. However, some 700 or 800 additional track laborers could be used to good advantage if available."

"Taking the line as a whole, our maintenance forces are probably about 25 per cent below normal, although the situation is considerably spotted. The western part of the territory is considerably shorter in men than the east end of the line."

TIES AND RAILS

(4) What proportion of your normal season's supplies of ties and rails have you on hand or immediately in sight?

The widely varying conditions relative to ties and rails are indicated by the replies received to this question. As is evident below, some roads are encountering little difficulty from this source, while others are in serious straits.

"We have all our ties on hand for 1918, as we make it a practice to have in stock the first of the year all ties necessary for that season. We are short on rail deliveries, although the mills continue to deliver us rail, in reduced quantities. It is quite probable that we will not complete our rail program because of this fact."

"On this date, with 42 per cent of the year gone, we have received 28 per cent of our yearly tie supply. In other words, we are receiving about two-thirds of our normal requirements and anticipate that this proportion will prevail throughout the year. With reference to steel rails we are only now receiving the last of what was contracted for delivery in the summer and early fall of 1917. We are so far unable to get any assurance of delivery on our 1918 rail, contracted for nearly two years ago for delivery to begin last March."

"Our tie and rail deliveries are about normal. We had some shortage in the delivery of ties in March and April, due to the fact that on account of the lack of creosote our plant did not start up until May 1, while it usually starts up about March 1. Our rail receipts are about normal this year, owing to the fact that up to this time we have been receiving shipments of rail on our 1917 order, which was short about 22,000 tons. We have also been short, and are still short, the rail joints for maintenance work."

"At this time we have about two-thirds the normal supply of cross-ties and four-tenths of 1 per cent of the normal supply of new rail."

"The outlook for normal tie requirements at this date is reasonably satisfactory. It is questionable, however, if we will be able to secure such a supply a renewal rail as will satisfactorily answer our demands."

"We have on hand or in sight about 70 per cent of the normal season's supply of ties, but only about 30 per cent of our rail requirements."

"We have on hand or in sight about 90 per cent of this season's ties. This year's contract for rail called for 50,000 gross tons and to date we have not received any of this tonnage. The rail received so far this year applied on our 1917 contract, which has just been completed. The purchasing department advises that we will possibly only receive about one-half of the 50,000 tons ordered for this year between now and January 1."

ADDITIONS AND BETTERMENT WORK

(5) How does your budget of Additions and Betterment work compare with that of normal years in magnificent roads varies widely, although in the aggregate it tude?

The amount of Additions and Betterment work on dif- is equal to or in excess of that for recent years. The variation is shown in the following replies:

"Our Additions and Betterment work is somewhat behind that of normal years because we appreciated the fact that our efforts should be directed toward maintenance this year and we have avoided all improvement work that could possibly be postponed."

"Our Addition and Betterment budget for 1918 is smaller than in normal years."

"Our budget for Additions and Betterment work is greater than has been normal for the past four or five years."

"About the usual Additions and Betterments are contemplated, but it is doubtful if labor and material can be had for them all."

"Our budget of Additions and Betterment work is considerably in excess of normal years, due to the great necessity therefor. It seems doubtful, however, owing to late approval thereof, whether we will be able to carry out that program to anything like its entirety."

"Our budget of Additions and Betterment work is considerably below that of normal years. We are only undertaking to secure authority for improvements that show a very decided necessity, and we are in a great many instances getting along with facilities that we would undertake to improve under normal conditions. The shortage of rail has reduced to a very great extent the work of increasing the weight of rail in our branch lines. The cost of work has increased to such an extent that it is rather difficult to compare the work we are doing with normal years, but it will not be more than 50 or 60 per cent."

"Our budget for Additions and Betterments as compared with other years is about normal."

PROGRESS ON BETTERMENT WORK

(6) Have you been able to make the customary progress this year? If delayed, to what extent, and the cause.

In view of what has been stated above it is to be expected that the progress on the Additions and Betterment work which has been undertaken has been slow and that the work is being interfered with by shortages of labor and material. These conclusions are borne out by the following replies:

"Our progress on work other than maintenance cannot be considered as fully up to our anticipations, but our efforts are being directed against those jobs most important to us and most affecting our operating conditions."

"We have not been able to make customary progress with Additions and Betterments and probably will not, due to labor and material shortages."

"We have not been able to make as good progress on tie insertions, laying new rail and ballasting as is customary, due to shortage of labor, ties and motive power for work trains. This latter trouble is being remedied by the dropping off of business and the fact that we have received some new engines."

"Customary progress has not been made this year. The delay has primarily been due to difficulty in getting sufficient labor, and to the inefficiency of that obtained. It is also due to difficulty and delay in getting material."

"With our very restricted program we are making quite satisfactory progress, although it is rather questionable how long we can keep this up, owing to the restlessness of the laborers."

"We have not been able to make the customary progress in maintenance this year on account of the slow delivery of rail and a shortage of all classes of common labor."

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IS IT PRACTICABLE TO USE RELEASED TIES AS FUEL?

The Acuteness of the Coal Situation Makes This Question
of Live Interest—Several Practical
Objections Exist

AT THE PRESENT TIME the fuel problem is holding a prominent place in the public mind. Recollections of the coal shortage and heatless Mondays last winter are still vivid, while the United States Fuel Administration is keeping before the people the necessity of conserving fuel in every way if similar or worse conditions are to be avoided next winter. Under these conditions it is not surprising that attention is being directed toward the apparent waste of fuel resulting from the burning on the right of way of old ties removed from the track.

That complaints regarding this practice are being received is indicated by the following letter from P. B. Noyes, Director of Conservation, United States Fuel Administration, which some of the regional directors have forwarded to the roads in their areas:

"This division of the Fuel Administration is being continually bombarded by letters and protests relative to and against the wasteful burning of old railroad ties. Many of these writers give specific cases where these ties are burned even after their sale has been refused by the railroad employees. The shortage of fuel will be, and is, so acute that nothing burnable should be wasted unless its conservation will cost too much in time, labor and transportation. We presume this matter has been thoroughly considered by the Railroad Administration or by the individual railroads and we are seeking information as to the present practice. If it is the practice to destroy rather than to conserve this material, we would like to be informed as to the reasons so we may be sure nothing reasonable is being left undone in the way of providing fuel."

Approximately 135,000,000 ties are being used by the railways of this country annually. Deducting those used for new tracks, at least 125,000,000 ties are used for renewal purposes each year, releasing an equal number for destruction. At first glance the wasting of this tremendous quantity of timber which might otherwise be used as fuel would appear highly extravagant, particularly under present conditions. However, there are certain local conditions which have led to the development of this practice in past years and which still exist which should be considered before final judgment is passed. For this reason we have made specific inquiries of a number of representative roads in different parts of the country regarding their present practices and their experiences in this connection.

The questions submitted to the roads were as follows:

- (1) How do you dispose of your old ties?
- (2) To what extent is there any demand for them for
 - (a) locomotive kindling,
 - (b) fuel by employees,
 - (c) fuel by residents along the line.

(3) Do you give or sell them to residents along the line? If sold, how and by whom is the sale negotiated?

(4) Where disposed of to employees or outside parties, what restrictions do you impose as to methods of delivery, liability for accident, etc.?

(5) What obstacles have you found to the various plans proposed for the disposal of ties?

REPLIES TO QUESTIONNAIRE

The replies to this letter of inquiry are given in abstract below.

AN EASTERN TRUNK LINE

We burn old rotten ties and such other ties that are not disposed of, sold, or given away. We allow each employee to have 50 ties when requested. We also sell them to residents along the line, such sales being covered by sales orders from our purchasing agent. When disposed of to employees or outside parties along the right of way, they take these ties at their own risk, under the supervision of our section foreman. Owing to the congested condition of the railroads at the present time the cost of picking up ties along the right of way, when sold to outside parties, is heavy. Ties have to be loaded under the supervision of railroad men, otherwise these parties will take ties suitable for use.

AN IMPORTANT ROAD IN THE CENTRAL STATES

It has never been our practice to refuse to furnish old ties for fuel to those along our right of way who cared to take them from our property after getting permission from the supervisor. When taking the old ties out of the track we throw them over next to the fence and let it be generally known that farmers or others can take them from our property, the only restriction being that care should be exercised not to destroy our right of way fences in removing the ties, and that special care shall be exercised by anyone coming on to our right of way at highway crossings for the purpose of taking the ties, making it necessary that the work be done under the direction of the section foreman or some other responsible person in the employ of the railroad.

We have met with very poor success in having the ties removed. Very few of the farmers have availed themselves of the opportunity to take the ties for fuel, and as a result this spring we were obliged to burn up a great many in the process of cleaning up our right of way.

We do not make it a practice to use old ties for locomotive kindling, because the expense of picking them up and getting them to divisions points and in condition to use for kindling is far greater than any benefit which would be derived therefrom.

A LARGE ROAD IN THE CENTRAL STATES

Prior to 1917 we disposed of our old ties by burning them on the right of way. This year and last year we are leaving them piled on the right of way and are offering them for fuel free of charge to anyone who will come and get them. We have never used old ties for locomotive kindling. A very small number of our employees use them for fuel. Not many residents along our line have, so far, taken advantage of our offer of these old ties. It seems to be the general feeling among them that the cost of working up old ties into fuel is too great.

AN IMPORTANT SOUTHERN ROAD

We dispose of our old ties by burning them on the right of way where we are unable to give them to persons who will remove them, or to turn them over to our section men for fuel. We use none for engine kindling. Our section men use them very largely, carrying them to the section houses on their truck car and frequently on work trains which are furnished by the company free of charge for this purpose. Residents along the line sometimes use them, but it is a difficult matter to get them to remove them promptly when they are released. They are always encouraged to use them. We do not sell them. We impose no restrictions as to liability or methods of delivery. Our section men usually place them over the right of way fence, or deliver them near public crossings where this can be done without incurring additional expense on our part. The difficulty about the public utilizing the cross ties is that they are usually unwilling to pay the cost necessary to bring them to market, and to remove them promptly when turned over to them on the ground. We have had great difficulty in commanding the necessary equipment and labor to load them for shipment to market even if a demand for them could be created.

A LARGE CENTRAL WESTERN ROAD

In November, 1911, this company issued instructions that old ties would be piled up on the right of way and not burned except in portions of the territory which were heavily timbered, where there would be no demand for these ties. It was the intention at that time to see if parties living adjacent to the right of way could not be interested in purchasing these ties from the railway company at a price materially less than the cost of wood, and at the same time pay the railway company for the expense of piling them up and thus disposing of them. It has always been the practice of this company to trade these ties to farmers and others adjacent to the right of way for the privilege of plowing fire-guards, setting up snow fences, moving wheat shocks and other things of this kind, and a great many ties in the untimbered portions of the territory have always found their way to the fuel piles of the various residents living adjacent to the right of way. We are unable to interest residents in purchasing these ties, so wherever parties will haul them off of the right of way they are given them gratis, unless we get some compensation in the manner above referred to. This company uses old ties at terminals for locomotive kindling, but makes no practice of loading up ties on the line and hauling them into terminals for this purpose. Section foremen, section laborers, and other employees living adjacent to the line are given old ties for fuel purposes. When ties are piled up on the right of way after being replaced, the roadmaster personally inspects each tie pile, and he also inspects all piles of ties hauled to section headquarters for other purposes which are to be used for fuel, in order to see that only ties unsuitable for other use are applied for fuel. It

was our intention if we had been able to interest the people living adjacent to the right of way to purchase old ties, that the railway company would haul them to the nearest highway crossing and pile them up so that they could be loaded conveniently. The purchase arrangements for the ties were to be made by the parties direct with the agent of the company, the loading to be supervised by the section foremen. The railway has been unable to interest those living adjacent to the right of way to purchase ties. They cannot see why these ties cannot be given them gratis, and with one exception, after a considerable period of attempt, we have only found one purchaser who was agreeable to paying 5 cents per tie for a few hundred ties.

AN IMPORTANT WESTERN ROAD

We do not burn any ties on our right of way unless there is no use to which we can put them in an economical way. They are used for locomotive kindling, fuel for employees or residents, or are turned over to the poor for fuel to be distributed through accredited charity organizations. They are used for fuel at a number of terminals, where the cost of handling and transportation is not too great. They are also used to a certain extent by section men along the lines and by farmers in exchange for plowing fire guards. We do not ordinarily give ties away except in exchange for plowing fire guards, or other work on the right of way, which is usually covered by contract. The section foreman is advised of these contracts and instructed regarding the disposal of ties. We have not been selling old ties. Ties are supposed to be delivered or received from the section foreman on the right of way. However, to protect ourselves from having new ties or usable material taken our contracts provide for ties remaining our property until used and we can have these ties returned to us at any time.

A NORTHWESTERN TRANSCONTINENTAL ROAD

We prohibited our men from selling or giving away old ties several years ago, but allowed section foremen and section men to use all of the ties taken from the track that they needed for winter fuel. The balance of the old ties were burned. In May, 1917, however, or shortly after we entered the war, we issued instructions that no more ties were to be burned on the right of way, and our plan has been that section foremen and section men were to use all of the ties taken from track that they needed for winter fuel, the balance to be given to any persons along our right of way who may wish them, with the understanding that they would take them away promptly and do so without disturbing any of our fences or other appurtenances. It is very important that ties be disposed of promptly when they are taken out of track, especially in warm weather.

AN IMPORTANT TRANSCONTINENTAL LINE

Old ties are placed in piles of 30 or less near where they are removed from track, the ends of those piled lying on one tie at right angles to the piles. This allows a rope sling to be passed around the pile and the ties loaded with an American ditcher or other hoisting derrick. By using the derrick only four laborers are required, two on the ground and two on the car. By using high-side coal cars from three to four hundred ties can be placed in car. Old ties are used for locomotive kindling at all division points, except on that part of the road where oil is used for fuel. Section foremen, track laborers and station agents are allowed to take old ties for their individual use as fuel. Old ties are not sold or given away to residents along the line. However,

there are many old ties appropriated by residents unknown to the officers or employees of the road. On busy operating districts section foremen or other employees are not allowed to move old ties to the station or section house on push cars, but ties for their use are loaded when loading for locomotive kindling. On branch lines where traffic is light section foremen are allowed to use push cars, taking in a small load of ties each day during the season the ties are being removed from track. In that way they accumulate a sufficient supply for their winter's fuel without any material added cost to the company. We have two circle saws on this district, one in use at terminals for sawing the ties in two for locomotive kindling, and the other, a smaller saw and frame, which is sent from place to place with a 12-hp. Fairmont engine on a motor car to saw the ties at the section house and for the section laborers who live in company bunk houses. The sawing is done on the man's own time. We furnish these facilities in order to retain men. We found that men would leave because it was necessary for them to chop up the old ties after they had done their day's work on the track, and the cost of transporting the saw and car is simply that of passing it from one station to another over the track. The men do the work of handling the ties to and from the saw in the morning before working hours and in the evening after working hours. However, this is not a universal practice all over our railroad.

A SOUTHWESTERN ROAD

We use old ties for locomotive kindling at division terminals. They are also used for fuel by employees along the line. Where there is a demand for them they are sold to farmers and ranchmen along the line. There does not appear to be a demand for them by the fuel men in the cities. Most of the ties are piled on the right of way and burned on account of a lack of practicable use for them.

AN IMPORTANT WESTERN ROAD

Our ties are of two kinds—about 25 per cent redwood and 75 per cent fir. We use our old redwood ties for fence posts on account of their failing as ties through mechanical wear rather than decay. Most of our fir ties we burn on the right of way. Employees use some, a few are sold at a nominal price of five cents per tie, but the bulk are burned as stated. None are required for engine kindling, as we use oil-burning engines. Perhaps 10 per cent are used by employees. About 5 per cent are sold to residents along the line. Such ties as are sold to residents are sold by the superintendent or their sale is approved by him. At one time the company made a trial of giving away old fir ties to such residents as would come to the right of way and get them. Abuses grew up, fences were knocked down and not replaced, and sometimes no distinction was made between old and new ties. Now no ties are disposed of except on purchase as above indicated. The bulk of our mileage lies in so mild a climate that fuel for heating is not a very big problem, and oil, kerosene or fuel gas is very largely used for what little heat is needed.

A LARGE GRANGER ROAD

One of the plans which has frequently been offered for the disposal of old cross ties is to have the railway company pick them up, load them on cars and transport them to the vicinity of large cities, where they can be turned over to poor and deserving people for use as fuel. The objection to this plan is the expense necessary to deliver them to some point where there is a demand for them. Such plans have always been

based on the sale of the ties after they are delivered near the large cities, and the railways have found that in order to cover their actual expense the price is so high that no one would want to buy the material. Furthermore, there is always such a demand for engine kindling wood in the vicinity of these large cities or terminals that the companies have used themselves for all of the ties they can afford to pick up and bring in.

As far as disposing of old cross ties to employees or residents along the line for fuel is concerned, there is much less demand for these old ties along our lines than one who is not familiar with the matter would realize. There have been many instances in the past, and in the recent past, where we have endeavored to find some one to recover old cross ties where it was not economical for us to pick them up and take them into some terminal for kindling wood. Occasionally some one is found who will use the old ties, but not always. It seems to be entirely a case of supply and demand. At points where they are less desirable to the railway for kindling wood they are also less desirable to residents or employees for fire wood.

In the prairie states, where timber is scarce, and where coal or other fuel is expensive, it is easy to dispose of them to outside parties, and this is occasionally done. However, locomotive kindling wood is also scarce in those states and the old ties are usually required for use by the company.

Some of the difficulties and the expense of picking up old ties are as follows: When the ties are removed from the track it is necessary to take the track men from other work to pile up the old ties on a push car and assemble them at some point where they are to be piled. Care must be used in piling the old ties so that they may be loaded on cars economically. After a sufficient number of them have been reclaimed, a work train is sent out to pick them up. A work train with crew, at this time, would probably cost \$50 or more per day. In addition to the work train, it is necessary to have a locomotive crane, a steam ditcher, or a bridge derrick, to pick up the ties and place them on the cars, or else have an extra gang or a number of section gangs accompany the train and throw them on by hand. During the summer, or working period, it is always difficult to release machines like locomotive cranes, steam ditchers or bridge derricks from more important work. If track men are used for throwing ties onto cars, this method is very expensive when labor is paid from 27½ cents to 30 cents per hour, and the men are also taken from other important work which should not be neglected. After the ties are loaded onto cars they are shipped to some point to be broken up for engine kindling. The great demand for engine kindling is usually in the large terminals where a great many engines are in service. In order to get the ties to these points where they are most desirable it often requires hauling them from 100 to 300 miles. Cars are taken from other service for the purpose, and these loads replace loads of revenue freight or other important company freight.

When they are received at the terminals where they are to be used they must be unloaded and piled up in such a manner that they can be rehandled readily, and are then either broken up by machines furnished for that particular purpose or sawed up or split with air machines. After being worked up in this manner they are then reloaded onto cars and sent to some point on inbound tracks leading to engine houses, where they are again unloaded and piled up where they can be obtained by hostlers taking engines into the roundhouse. While

all of this entails considerable expense, it is usually found cheaper to recover the old ties for engine kindling than it is to buy slabs or some other kind of material.

A LARGE SOUTHERN ROAD

As far as is possible we use old ties for engine wood where it is found more economical than the purchase of cord wood. We also allow our foremen or other employees to use old ties for fuel where they are willing to take them without additional expenses to the railroad. Wherever there is a surplus of old ties it has been the practice to give them to farmers or outside parties where they would take them from the right-of-way. In other words, we have endeavored to make as much use of the old ties as possible for fuel or for the benefit of outside parties along our lines, which has had a tendency to create a good feeling among the farmers adjoining the railroad.

We have never sold any ties to residents along the line, but a recent circular of the regional director requests that this be done. This will be handled through our purchasing department for sale order the same as used in disposing of any other class of material. In disposing of ties, the only restriction is that the railroad company should not be put to any additional expense over and above the expense if the ties were burned on the right-of-way. Each party is held responsible for his own acts while loading or hauling the ties. It has been found in numerous places that outside parties did not care for the ties and would rather purchase fresh fuel from dealers in their vicinity. As a consequence it is necessary to burn large numbers of ties which could have been used for fuel. There are also times when it is difficult to get on to the right-of-way at a reasonable number of points to load the ties out.

RAILROAD ADMINISTRATION ORDERS

The Railroad Administration at Washington has given consideration to this problem and the matter has also been called to the attention of the regional directors. In the southern region the question of the disposal of old ties has been under consideration, but because of the widely varying conditions it has been concluded that it is not possible to establish a uniform rule. Therefore, the determination of the problem has been left to the discretion of the managements of the individual lines.

In the Northwestern, the Central Western and the Southwestern regions circulars were issued to the roads on June 28 as follows:

"Please be governed by the following suggestions as to the disposition of old ties:

"1. Old ties will be used for lighting fires in engines to such an extent as it may be advantageous and economical, and when such program is determined they will be picked up and delivered at engine houses.

"2. Section men, foremen or other employees will be allowed such old ties as the roadmaster may allot them for their personal use only.

"3. Ties may be given to adjoining farmers in exchange for plowing fire guards, mowing right-of-way of the company, or for the privilege of erecting snow fences on adjoining land, under the direction of roadmaster and division superintendent.

"4. Old ties may be disposed of to the public at such places as there may be a demand for them at such reasonable prices as may be determined by the proper officers, provided ties can be picked up by the purchaser without expense to the railway company.

"5. On divisions and districts in wooded country where there is no demand for old ties, and on other divi-

sions where ties cannot be disposed of in accordance with the preceding paragraphs, old ties will be burned under favorable weather conditions so that the right-of-way will be kept cleaned up."

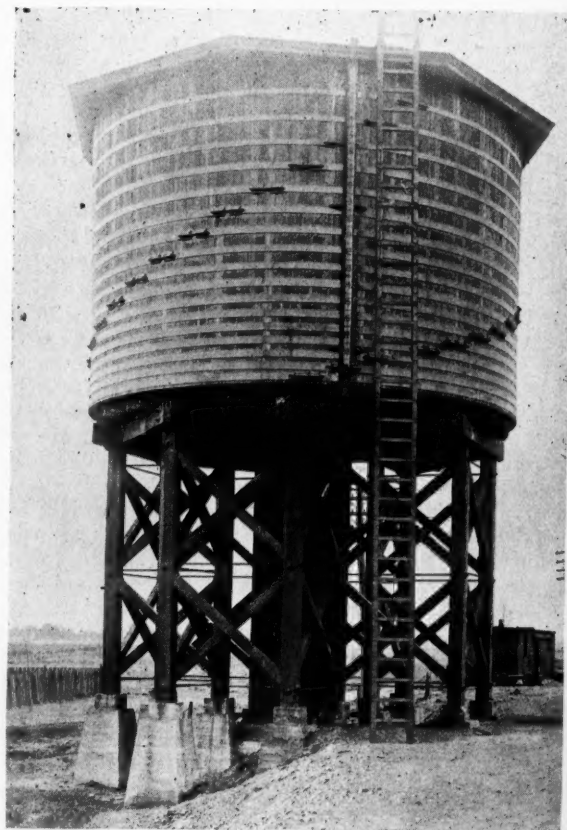
It is evident from the above that, in general, local conditions make it uneconomical for residents along the line to utilize the old ties released from tracks for fuel. From the standpoint of the users, the difficulty of transporting them from the right-of-way where released to the point of use are so great as to render the purchase of other fuel more economical. As pointed out in the replies of the railways, the giving or selling of ties to non-employees has commonly led to more or less serious abuses. While, therefore, it is true that a large amount of fuel in the form of old ties is being destroyed on the railways, the cost and inconvenience incurred by the users in making them available for fuel are such as to render their use impracticable.

CREOSOTED WATER TANKS

By C. R. KNOWLES,

Superintendent Water Service, Illinois Central, Chicago

THE ILLINOIS CENTRAL has recently adopted creosoted timber for its standard wooden water tanks. Seven of these tanks constructed during the past winter have proved so successful that this road is now building more and has practically made the creosoted tank standard. This step was taken because of the high



ONE OF THE NEW TANKS BUILT AT MATTOON, ILL.

price and great demand for steel for other purposes than tank construction, and the scarcity and cost of timber that would be suitable for use without treatment.

Although many different timbers are commonly used untreated in the construction of water tanks, there are but few that are available in suitable sizes and lengths to be used in the construction of large tanks, and when the life of the timber is considered this list may possibly be reduced to two timbers, namely, cypress and redwood. The great demand for these timbers has been such their price has advanced rapidly and suitable lengths are difficult to obtain. Undoubtedly the timber situation will grow worse as the war continues. Thus the use of lower grade timber that will take treatment readily appears to be a timely move.

The creosoted tanks being built by the Illinois Central are of their standard sizes, 100,000 gal. capacity with a 20 ft. stave and 30 ft. bottom, and 50,000 gal. capacity having a 16 ft. stave and 24 ft. bottom, no change having been made in the plans formerly used for the construction of untreated wood tanks. The timber used is loblolly pine coming under the general specifications for tank timber except that no restrictions are enforced as to heart or sap. The timber is air seasoned and should be permitted to season for three months in favorable weather.

The timber is treated by the Rueping process, using about five pounds of oil per cubic foot of timber. The oil used is American Railway Engineering Association No. 1 coal tar creosote. The tank tower, constructed of 12 in. by 12 in. posts and 6 in. by 8 in. braces, roof, frost box, ladder and all timber entering into the complete structure is creosoted.

A very important feature in the construction of these tanks is that all timber more than one inch in thickness

is framed before treatment. The work of framing the tank before treatment is given such careful attention that it has rarely been necessary even to bore a hole in the treated timber during the field erection of the tank. The work of framing and treating is done by company forces at the Grenada, Mississippi, creosoting plant. The tanks are erected by line gangs. Thus in the manufacture and erection of these tanks the Illinois Central is independent of outside forces except the mills who cut the timber and ship it to Grenada in the rough.

When one discusses creosoted tanks for the storage of water the question is immediately raised as to the effect of the creosote on the water. In the tanks constructed on the Illinois Central the effect from the creosote in the water was so slight as to be hardly noticeable, and had no detrimental effect upon the water whatever. The Bureau of Industrial Research of the University of Washington conducted extensive tests of creosote wood stave pipe to determine its effect upon water for domestic and irrigation purposes.

The test was conducted to determine the effect upon water carried by a 56-in. creosoted wood stave pipe line 22½ miles long, from the Landsberg intake on the Cedar river to the Volunteer Park reservoir in the City of Seattle. In conducting the experiment a smaller pipe was used, but care was exercised to have the conditions in the experiment representative of those existing in the large pipe line. The conclusions of the Bureau were that there was no detrimental effect on the water from the creosote. These conclusions have been borne out fully by the results obtained on the Illinois Central with its new tanks.

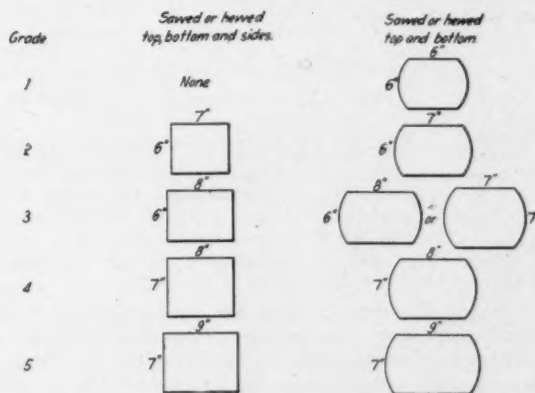
Standard Specifications for Cross Ties

STANDARD SPECIFICATIONS for cross ties have been adopted by the Central Advisory Purchasing Committee of the Railroad Administration on recommendation of the regional purchasing committees and approved by C. R. Gray, director of operation, and John Skelton Williams, director of finance and purchases. Shortly after the organization of the purchasing committees, orders were issued that railroads should buy ties only along their own lines and supply ties to other roads which could not secure their requirements in their own territory. This made it necessary to establish prices for ties and difficulty ensued because of the many variations in sizes and kinds. Under the standard specifications 10 grades have been adopted, including four sawed or hewed on all sides and six sawed or hewed only on top and bottom, in place of 30 or more odd sizes formerly bought.

Only the kinds of wood and ties now in use have been adopted, but some new methods have been introduced into the practice in connection with the handling and purchasing of ties. Where formerly the tie most generally used on a road or the largest size used was classed as grade No. 1, the grade numbers have been changed so that No. 1 applies to the smallest size and the grade numbers increase with the size, on the theory that a larger size tie than is now generally used may be introduced, but it is not likely that any smaller size will be used. The grading has also been arranged so that the bearing of the rail on the tie is the deciding factor instead of the cross section. This means that from a log of a given size the manufacturer will not be paid for the sapwood which he may leave upon it if the tie is sawed or hewed only at top and bottom. All sizes of ties are

provided for in the specifications, which makes it possible to utilize all the logs in the tree or all the trees in a forest. These specifications are as follows:

Kinds of Wood—Before manufacturing ties, producers should ascertain from the railroad to which they contemplate delivering them just which of the following kinds of wood suitable for cross-ties will be accepted: Ash, beech, birch, catalpa, cedar,



DIMENSIONS OF STANDARD CROSS TIES

cherry, chestnut, cypress, elm, fir, gum, hackberry, hemlock, hickory, larch, locust, maple, mulberry, oak, pine, redwood, sassafras, spruce, sycamore and walnut. Others will not be accepted unless specially ordered.

Quality—All ties shall be free from any defects that may impair their strength or durability as cross-ties, such as decay, splits, shakes or large or numerous holes or knots.

Ties from needleleaved trees shall be of compact wood, with not less than one-third summerwood when averaging five or more rings of annual growth per inch, or with not less than one-half summerwood in fewer rings, measured along any radius from the pith to the top of the tie. Ties of coarse wood, with fewer rings or less summerwood, will be accepted when specially ordered.

Ties from needleleaved trees for use without preservative treatment shall not have sapwood more than two inches wide on the top of the tie between 20 in. and 40 in. from the middle, and will be designated as "heart" ties. Those with more sapwood will be designated as "sap" ties.

Manufacture—Ties ought to be made from trees which have been felled not longer than one month.

All ties shall be straight, well manufactured, cut square at the ends, have top and bottom parallel, and have bark entirely removed.

Dimensions—Before manufacturing ties, producers should ascertain from the railroad to which they contemplate delivering them just which of the following lengths, shapes and sizes will be accepted.

All ties shall be 8 ft. or 8 ft. 6 in. long.

All ties shall measure as follows throughout both sections between 20 in. and 40 in. from the middle of the tie:

The above are minimum dimensions. Ties over one inch more in thickness, over three inches more in width, or over two inches more in length will be degraded or rejected.

The top of the tie is the plane farthest from the pith of the tree, whether or not the pith is present in the tie.

Delivery—All ties ought to be delivered to a railroad within one month after being made.

Ties delivered on the premises of the railroad shall be stacked not less than 10 ft. from the nearest rail of any track at suitable and convenient places; but not at public crossings, nor where they will interfere with the views of trainmen or of people approaching the railroad. Ties should be stacked in alternate layers of two and seven, the bottom layer to consist of two ties kept at least six inches above the ground. The second layer shall consist of seven ties laid crosswise of the first layer. When the ties are rectangular, the two outside ties of the layers of seven and the layers of two shall be laid on edge. The ties in layers of two shall be laid at the extreme ends of the ties in the layers of seven. No stack may be more than 12 layers high, and there shall be five feet between stacks to facilitate inspection. Ties may be ranked like cordwood, in which case the owner shall rehandle them while inspection is being made. Ties which have stood on their ends on the ground will be rejected.

All ties are at the owner's risk until accepted. All rejected ties shall be removed within one month after inspection.

Ties shall be piled as grouped below. Only the kinds of wood named in the same column may be piled together.

CLASS U—TIES WHICH MAY BE USED UNTREATED

Group Ua	Group Ub	Group Uc	Group Ud
Black Locust	"Heart" Pines	"Heart" Cedars	Catalpa
White Oaks	"Heart" Douglas	"Heart" Cypress	Chestnut
Black Walnut	Redwood	Red Mulberry	Sassafras

CLASS T—TIES WHICH SHOULD BE TREATED

Group Ta	Group Tb	Group Tc	Group Td
Ashes	"Sap" Cedars	Beech	Elms
Hickories	"Sap" Cypress	Birches	Hackberry
Honey Locust	"Sap" Douglas	Cherry	Soft Maples
Red Oaks	Fir	Gums	Spruces
	Hemlocks	Hard Maples	Sycamore
	Larches		White Walnut
	"Sap" Pines		

Shipment—Ties shall be separated in the car according to the above groups and sizes as far as practicable.

A Forest Products Section has been organized by the Central Advisory Purchasing Committee with M. E. Towner, purchasing agent of the Western Maryland, as manager, and with office in the Southern Railway building, Washington. The Forest Products Section devotes itself to such matters as specifications for lumber products, such as lumber for the cars recently ordered by the government, the distribution of lumber to the car building plants and also the distribution of orders for ties from one region to another. Under the order that a railroad may not directly purchase ties off its own line, a railroad which cannot meet its own requirements in its

chasing committee, which refers the matter to the Central Purchasing Committee, and the Forest Products Section acts as a clearing house.

Following the preparation of these specifications, the purchasing department of the Railroad Administration has established maximum prices which those roads under Government control may pay for ties. Under previous instructions the roads are limited in their purchases to those ties produced along their lines. Any surplus beyond those needed for the use of the originating lines will be distributed by the Central Purchasing Department to the roads in non-producing territories. Uniform prices will be paid by the railroads to large and small producers alike.

The following are the prices which have been established in the different regions. Where a range of prices is shown it indicates that different maxima have been established in various tie producing areas in the region. These prices are based on ties 8 ft. 6 in. long, the quotations being 3 cents less than quoted below for ties 8 ft. long. These prices are f. o. b. right-of-way. An allowance of 3 cents per tie additional is made for loading in cars. While figures have been established for the Central Western and Southwestern regions, they were not made public at the time of going to press:

MAXIMUM PRICES F. O. B. RIGHT-OF-WAY

EASTERN REGION

Grade No.	Ua	Ub	Uc	Ud	Ta	Tb	Tc	Td
1	\$0.60-0.90	.....	\$0.70	\$0.39-0.50	\$0.39-0.60	.....	\$0.34-0.50	
2	0.70-1.00	.....	0.45-0.85	0.58-0.60	0.58-0.70	.....	0.50-0.60	Same as Tc
3	0.85-1.10	.....	0.75-0.85	0.77-0.90	0.77-1.00	.....	0.67-0.90	
4	1.03-1.25	.....	0.80-0.85	0.85-1.05	0.85-1.15	.....	0.75-1.00	
5	1.10-1.40	.....	0.85	0.92-1.15	0.92-1.30	.....	0.82-1.10	

ALLEGHENY REGION

Grade No.	Ua	Ub	Uc	Ud	Ta	Tb	Tc	Td
1	\$0.70	.....	.....	\$0.50	\$0.60	.....	\$0.50	
2	0.80	.....	.....	0.60	0.70	.....	0.60	Same as Tc
3	1.10	.....	.....	0.90	1.00	.....	0.90	
4	1.25	.....	.....	1.05	1.15	.....	1.00	
5	1.40	.....	.....	1.15	1.30	.....	1.10	

POCAHONTAS REGION

Grade No.	Ua	Ub	Uc	Ud	Ta	Tb	Tc	Td
1	\$0.53-0.70	.....	.....	\$0.38-0.40	\$0.38-0.50	.....	\$0.38-0.40	
2	0.68-0.80	.....	.....	0.50-0.53	0.53-0.60	.....	0.50-0.53	Same as Tc
3	0.83-1.10	\$0.60	.....	0.68-0.70	0.68-0.80	0.37	0.68-0.70	
4	0.93-1.25	0.65	.....	0.78-0.80	0.78-0.90	0.42	0.78-0.80	
5	.....	0.70	.....	.....	.....	0.44	.....

SOUTHERN REGION

Grade No.	Ua	Ub	Uc	Ud	Ta	Tb	Tc	Td
1	\$0.33-0.60	.....	.....	\$0.18-0.40	\$0.18-0.50	.....	\$0.38-0.40	\$0.38-0.40
2	0.43-0.70	.....	.....	0.28-0.50	0.28-0.60	.....	0.50-0.53	0.50-0.53
3	0.58-0.90	\$0.60	\$0.65	0.43-0.70	0.43-0.80	\$0.37	0.43-0.70	0.43-0.70
4	0.68-1.00	0.65	0.70	0.53-0.80	0.53-0.90	0.42	0.53-0.80	0.53-0.80
5	0.73-1.10	0.70	0.75	0.58-0.90	0.58-1.00	0.44	0.58-0.90	0.58-0.90

NORTHWESTERN REGION

Grade No.	Ua	Ub	Uc	Ud	Ta	Tb	Tc	Td
1	\$0.86	\$0.47-0.76	\$0.47-0.79	.....	\$0.74	\$0.47-0.76	\$0.69-0.79	\$0.69-0.79
2	0.92	0.56-0.82	0.56-0.85	.....	0.80	0.56-0.82	0.75-0.85	0.75-0.85
3	1.03	0.64-0.93	0.64-0.96	.....	0.91	0.64-0.93	0.86-0.96	0.86-0.96
4	1.03	0.75-0.93	0.75-0.96	.....	0.91	0.75-0.93	0.86-0.96	0.86-0.96
5	1.03	0.89-0.93	0.89-0.96	.....	0.91	0.89-0.93	0.86-0.96	0.86-0.96

SWEDISH PURCHASE OF GERMAN RAILS—The Swedish Railway management has entered into a fully guaranteed agreement with the German Steel Trust for the delivery of 80,000 tons of rails. One-third of the deliveries is to be made in each of the years 1918, 1919 and 1920. Payment is to be made by the deposit in the German Reichsbank and about half of the amount, \$3,105,000, is to be paid immediately.—Commerce Reports.

AN INTERESTING EXPERIENCE WITH BOCHE AIR RAIDS

THE FOLLOWING LETTER, giving an unusually concise description of German air raids in France, was written to P. W. Moore, vice-president of the P. & M. Co., Chicago, by F. A. Preston, general sales agent of the same company until his departure for France last year as a member of a special commission for the United States Government:

Somewhere in France,
May 27, 1918.

I returned to ——— Sunday and was much entertained for the second time by a Boche raid on Tuesday. It caught me this time in bad shape, for I was calling on my old French family fully three miles from my present residence, when the "alert" started, and I had the choice of staying all night in the cellar with five scared Frenchwomen or beating it for my home on foot, without a light in the streets and very little knowledge of the proper direction. I chose the latter, and I am glad I did, as I saw the prettiest aeroplane fighting that night that I have ever seen; the sky was full of machines (all French but with a few American pilots) with all kinds of signaling, etc., and a steady stream of bursting shrapnel. The captive balloons were up everywhere with their piano wire nets for the Boche aviators.

The past week has been a busy one with more than the usual excitement. Since I arrived here we have had four air raids, and this morning "Big Bertha" started off again at 6 a. m. and kept up her work every 15 min. until noon. The line of her fire is not far from my place of business and a few shells fell uncomfortably close. It is quite remarkable how soon we get accustomed to these minor disturbances. For instance, to-day the explosions, though very loud and causing the windows to shake a bit too much, made no confusion in the work of the office. In fact, it was not noticeable that anything unusual was taking place.

Last Sunday I had my first ride and the experience was negligibly exciting. I went up in an English Sopwith—a comfortable riding old ship, safe as a church and absolutely acrobatic proof. We soared over the outskirts of the city at a height of about 3,000 ft., dove under a few clouds and hove to at the starting line without a quiver.

Our first Liberty appeared about two weeks ago and now has been assembled and flew to ——— yesterday, where I happened to be. There were a hundred or so transfer pilots around and when this new thing appeared we thought for the moment it was a Boche who had lost his way. She looked mighty good after her 125-mile flight, and the pilot, who is an expert, told me her performance was splendid. Lots of power, a great climber, fast as anything we have here and very easy to control, etc.

The Liberty engine is not perfect, but her preliminary tests show that she is a highly efficient machine with great possibilities, and, best of all, I understand the production question is settled and we can expect any number from now on. In any event, we have an all-American-made machine that compares favorably with the best here and we are going to be able to provide in the next few months as many as our pilots here can possibly take care of. The Boche has got a good trimming coming to him this summer in the air or my vision is badly wrong.

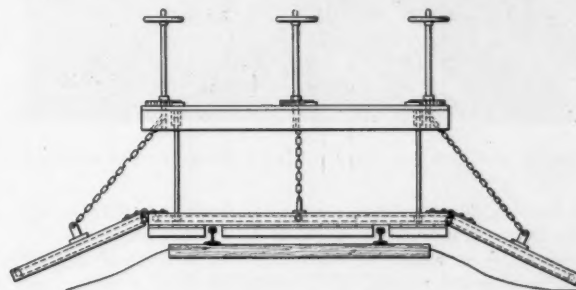
The air raids over the city have not amounted to much with the exception of the last, which was a duplex affair. Two Boches got through the barrage on the second trip, and one, if I am not mistaken, passed over the house where I am living. From my balcony I could see him

against the moon and stars. I never saw such a heavy barrage, and they were big guns, 105s. How a machine could get through it is very remarkable.

As I write this letter, the "alert" has sounded and the Boche are here once more. In a few minutes the barrage will start and I shall spend the next hour on my little balcony watching the fireworks in the heavens and seeing the poor French people scurrying to the abris until the "all clear" signal is given.

A NEW WEED DESTROYER

THE MOST RECENT PLAN for the removal of weeds from railway track is to burn them off with high temperature steam taken from a locomotive and applied close to the ground by means of perforated pipes. Equipment arranged to accomplish this effect was put into use last year and has been applied with success on several roads in the southwest, where this idea had its



CROSS-SECTION OF BURNER MOUNTED ON A FLAT CAR

origin. Two machines are in operation on the Missouri Pacific, for which another one is now in the course of construction. One is in operation and one under construction on the Texas & Pacific, and one is in use on the International & Great Northern, while arrangements are now being made to use it on a number of other lines.

The success of this device lies in the application of the steam at the high temperature to be obtained in steam at locomotive boiler pressure, that is, nearly 400 deg. for saturated steam and much higher temperatures for superheated steam. Therefore, the plan has been worked out to provide not only for bringing the jets of steam in close contact with the vegetation, but for repeated application by a large number of jets closely spaced and for the retention of the heat in the steam until released by the use of an insulating covering over the system of pipes.

The burner may be attached to the underside of any car, although for practical purposes a flat car proves the most convenient. It consists of three grids of pipes, a central portion under the car, with wings on either side that are hinged so that they may be raised to clear cattle guards, etc. In addition to facilities for raising these wings, provision is made for lifting the central portion to clear crossing planking, switches or other track features interfering with it in the lowered position. Each portion of the apparatus is provided with a manifold or main pipe placed in a longitudinal position for distributing the steam to the transverse pipes forming the grid. The large pipe of the central section is 2½ in. in diameter, while those for the wings are 1½ in. in diameter. The laterals are made of either ¾-in. or 1-in. pipe, while the holes for the steam jets are ⅝ in. in diameter and are spaced 3½ in. apart. Pipe connections between the wings and the central portion and between the latter and the steam line are equipped with ball joints to permit free

movement. The three portions of the device are covered with sheet metal, lined with $\frac{1}{8}$ -in. asbestos board to serve as an insulator, as previously explained. An apron of heavy fabric attached to the edges of the burner so as to drag on the ground serves to retain the steam over

and other track work subject to trouble with ice and sleet in the winter time.

The patent on this device is owned by the Dean-Williams Weed Destroyer, Little Rock, Ark., and is being used on railroads by royalty arrangement with this company, each road preparing its own equipment.

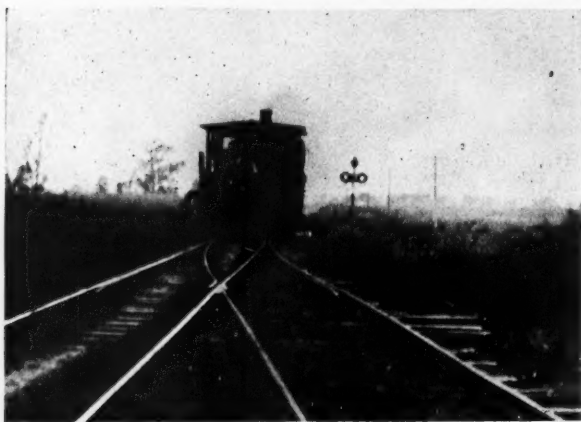


END OF A PASSING TRACK JUST BEFORE TREATMENT

the area under treatment and very little escaping steam is to be seen when the machine is in operation.

Actual tests with this equipment show that it can be used with good results at a speed of 4 to 5 miles per hour. The growth of vegetation above the ground surface is entirely killed and immediately withers and dries up. The accompanying photographs illustrate what can be done by this method.

As stated above, the machines have been used thus far principally in the southwest, where the summer sea-



APPEARANCE 24 HOURS LATER

son is long. Consequently it has been found desirable on these roads to give the track three treatments during the season, the first one in the spring as soon as the vegetation has obtained a fair start, the second in July and the third in September. It is believed that two treatments would be sufficient on northern roads where the growing season is not so long. In general the progress made is about 25 miles per day at a total operating cost of \$3 to \$7 per mile.

Another use for these machines upon which they have had some practical application is the thawing of switches

A NEW AIR-COOLED MOTOR CAR ENGINE

THE ACCOMPANYING PHOTOGRAPH shows a gas engine used on railway motor cars which has a number of features that distinguish it from most power units of this type. It is an air-cooled engine. Heavy ribs on the cylinder and a fly wheel fan account for the reported success of the air cooling under a variety of conditions. One feature of a rather unusual nature is the facility with which the engine may be mounted with the cylinder in either a horizontal or vertical position. While engines of this type having two or four cylinders are in



ENGINE MOUNTED ON A CAR WITH THE SEAT REMOVED

use, the single cylinder engine is of most general application. The engine is of the two-cycle type permitting of reversing the direction of operation.

The motor has been applied to a variety of purposes, including farm tractors, motor trucks, etc., and has had extensive application for a considerable time to railway motor cars. Roads on which it has been applied in this manner include the Great Northern, the Northern Pacific, the Chicago, Milwaukee & St. Paul, the Chicago, Rock Island & Pacific, the Santa Fe, the Missouri Pacific and others. The proportions are such that it is readily applied, and the motor, together with the gasoline tank and the batteries, take up very little room.

This motor is known as the Veerac engine, and is being sold for use on motor cars by the Madden Company, Chicago.

PRIZES FOR PICKING UP MATERIALS

LARGE NUMBERS OF NUTS and other small materials commonly fall from equipment and are lost along the right of way. Those parts which are found are usually thrown in the scrap bin and eventually are either sold as scrap or reclaimed at some central point. In order to conserve this material, M. H. Broughton, division superintendent of the Connellsville division of

the Baltimore & Ohio, has offered prizes to the section foremen who bring in the most material of a certain type in a given period. Some time ago the division was short of grease cup plugs, and first and second prizes of \$2 and \$1 were offered to the foremen. As a result of this offer 1,086 plugs were turned in. Later the repair track forces



NUTS COLLECTED BY TRACK FORCES

were short of 1-in. nuts and the offer of similar prizes brought in more than 2,800 serviceable car or engine nuts of the specified size. This later offer was repeated 30 days and again 60 days later. As a result of these measures, the division was self-sustaining as far as nuts and grease cup plugs were concerned for 90 days. While the attention which has been directed to this subject since the announcement of these contests has resulted in the division being quite thoroughly cleaned up, the effects of the campaign are still noticeable in the regularity with which the track men are sending in materials of this kind as they find them.

THE MATERIAL MARKET

THE PROSPECT OF A Government purchase of rails, carrying with it the establishment of a fixed price for rails, has been brought closer to realization by a recent conference between the manufacturers and the Government concerning this railway material. Up to the time of going to press no definite action has been taken. The price seems to be the most difficult factor. The Iron Age says: "Only 100,000 tons additional of rails are wanted for this year, and the railroad administration wants the price fixed chiefly in view of large purchases to be made for 1919. The stand taken for a \$42 price for Bessemer rails is in the face of an average cost of \$50 or more, and the contention of one producer is that it should have \$60 for Bessemer and \$65 for open hearth rails." There is very little activity in the market for other track material.

Results of the railway administration's budget for Additions and Betterments are seen in an increased impetus given to orders for structural steel by the railroads. The Central Railroad of New Jersey and the Virginian have each awarded contracts for about 3,000 tons, and a number of other railroads have arranged for structural steel in amounts varying from 100 to 1,200 tons. The scrap market is becoming less and less of importance to the railroads owing to the arrangements which have been made for the transfer of this material from road to road in many cases where it is at all usable.

Recent revisions in the Government prices for both yellow pine and Douglas fir lumber, which apply to all purchases by railroads, indicate substantial advances over those previously established. In the case of Douglas fir

these amount to an increase of about \$2 per 1,000 ft. b. m. It is also interesting to note that on July 2 these prices were extended to cover purchases by the general public as well as Government agencies. Typical prices for yellow pine and Douglas fir, taken from the schedules of established prices (f. o. b. mill), are given below for items in use in the maintenance of way department:

YELLOW PINE

	ROUGH BOARDS AND FINISH		RANDOM LENGTHS	
	B&Btr. (C)	"C" (C)	No. 1 Com. (D)	No. 2 Com. (D)
1 x 4	\$35.00	\$31.50	\$28.00	\$23.00
1 x 6	36.50	33.50	29.00	24.00
1 x 8	36.50	33.50	29.00	25.00
2 x 4 to 8 in.	41.50			
2 x 10 & 12 in.	43.50			

(C) In Grades B and better and "C", for specified lengths up to 20 ft. add \$1.

(C) In Grades B and better, "C", No. 1 and No. 2 Common, for 22 and 24 ft. add \$2.

(D) In Grades No. 1 and No. 2 Common, for specified lengths up to 20 ft., except 16 ft. add 50 cents per thousand; for 16 ft. add \$1.

ROUGH PLANK AND DIMENSION (E)*

	12, 14 & 16 Ft.	10, 18 & 20 Ft.	22 & 24 Ft. (F)	Random
2 x 4 No. 1 Common.	\$23.00	\$25.00	\$26.50	\$23.00
2 x 8 No. 1 Common.	22.50	24.50	26.00	22.50
2 x 12 No. 1 Common.	25.00	26.50	28.00	25.00
2 x 4 No. 2 Common.	21.50	23.50	25.00	21.50
2 x 8 No. 2 Common.	21.00	23.00	24.50	21.00
2 x 12 No. 2 Common.	23.50	25.00	26.50	23.50

(E) For 2-in. stock ordered kiln dried add \$2.

(F) For lengths over 24 ft. add \$1 for each 2 ft. up to and including 32 ft.

*For rough plank and dimensions cut full size, see prices under K.

ROUGH PLANK AND TIMBERS No. 1 COMMON CUT TO FULL SIZE (K)

	10 to 20 Ft.	22 & 24 Ft.	28 Ft.	32 Ft.
2 x 4	\$26.00	\$27.00	\$29.00	\$31.00
2 x 8	25.00	26.00	28.00	30.00
2 x 12	31.00	32.00	34.00	36.00
3 x 6 to 8 x 8	24.00	25.00	27.00	29.00
3 x 12 to 5 x 12	30.00	31.00	33.00	35.00
6 x 12 to 12 x 12	29.00	30.00	32.00	34.00
6 x 14 to 14 x 14 (J)	34.50	35.50	37.50	39.50

(J) For timbers over 14 in. in width add \$3 for each 2 in. or fraction thereof.

(K) For timbers over 32 ft. add \$1 for each additional foot in length over 32 ft.

Add to No. 1 Common Long Leaf for following grades:

	General Exceptions	Add to Foregoing Prices Per M. Ft. B. M.
For Sound and Square Edge		\$1.00
For Standard Heart Grade 12 in. and under		4.00
For Standard Heart Grade 14 in. and under		5.50
For Standard Heart Grade 16 in. and under		6.50

DOUGLAS FIR

FIR COMMON BOARDS, SIS OR SHIPLAP

1 x 4-6 to 20 ft. mixed lengths, Sis.	\$18.00
1 x 6-6 to 20 ft. mixed lengths, Sis or S. L.	18.50
1 x 8-6 to 20 ft. mixed lengths, Sis or S. L.	19.50

FIR COMMON DIMENSION, SISIE

	6 Ft.	8-12-14 Ft.	16 Ft.	26 to 32 Ft.
2 x 3 and 2 x 4	\$17.50	\$18.50	\$19.50	\$23.50
2 x 6 and 2 x 8	17.50	18.00	19.00	22.00
2 x 12	18.50	19.50	20.00	23.50

FIR TIMBERS, SINGLE CARLOAD LENGTHS ROUGH

	32 Ft. and Under	34 to 40 Ft.
6 x 16 to 10 x 16	\$27.00	\$29.00
6 x 18 to 10 x 18	28.00	31.00
10 x 10 to 12 x 12	25.00	27.00
10 x 14 to 14 x 14	25.50	27.50

Grade in accordance with West Coast Lumberman's Association Grading Rules, Rail A list issued January 1, 1917.

Standard specifications for cross ties have been adopted by the Central Advisory Purchasing Committee of the Railroad Administration and considerable progress has been made in establishing prices for the various grades of ties under these specifications. A full account of this work will be found on another page of this issue.

GENERAL NEWS DEPARTMENT

The Sundry Civil Appropriation Bill which was passed by the Senate on June 24 carries an appropriation of \$3,500,000 for continuing the valuation work of the Interstate Commerce Commission, and one of \$5,250,000 for the Alaska Railroad. The bill had already been passed by the House.

The Presidential and Diplomatic Suite of rooms at the Union Station in Washington, D. C., formerly used exclusively for State purposes, has been converted into a canteen station for soldiers, sailors, and marines in transit, and will be in charge of the American Red Cross.

George W. Rear, general bridge inspector of the Southern Pacific, was elected president of the Pacific Railway Club on June 13, to fill a vacancy created by the resignation of P. P. Hastings, who has taken a position in the Division of Traffic of the United States Railroad Administration at Washington. Mr. Rear was first vice-president of this club.

The Northwestern Pacific was indicted by a federal grand jury at San Francisco, Cal., on June 18, on a charge of destroying and failing to keep permanent records of its history and operations as required by the Interstate Commerce Commission. The action against the road is the result of the disappearance of papers and documents deemed essential to an accurate valuation of the company's property.

The Pennsylvania Railroad has collected figures showing that during the month of June 250,322 cars passed Columbia, Pa., on its low grade line, an average of 8,344 cars per day. This is equivalent to 70 miles of freight cars per day, if placed end to end. The heaviest movement for any single day was on June 20, when 9,531 cars passed. So far as is known, this stands as the world's record for the greatest number of freight cars which have ever moved past a given point in 24 consecutive hours on any railroad. Of the total cars passing eastbound in the month 96 per cent were loaded, while 75 per cent of those moving westbound were empty.

The Chicago, Burlington & Quincy's Big Horn Basin line has been put out of commission for the second time within the past month, due to a cloudburst in the vicinity of the Bad Water river. A considerable portion of the track and a number of bridges were washed out. Two weeks previous to the last cloudburst the same track and bridges were damaged. The repairing of this damage had been completed only a few days before the second storm happened, resulting in certain parts of the new work being washed away.

Purchase of the Virginian Railway, by the Government, is proposed in a bill introduced in Congress on June 21 by Senator James Hamilton Lewis of Illinois. The Virginian runs from the coal fields of West Virginia to tidewater at Norfolk, and the senator's proposal includes 125,000 acres of West Virginia coal land. The total proposed expenditure is \$115,000,000. Mr. Lewis bases his proposal upon the necessity of insuring an adequate supply of coal for the navy, and he says also that such a purchase would afford the means to make a test, on a small scale, of Government railroad ownership.

Work on the new union station at Chicago has been suspended until after the war. This decision was reached at a conference between the city council's committee on railway terminals, representatives of the Chicago Railway Terminal Commission and representatives of the Railroad Administration, held in the office of the regional director of northwestern railroads, at Chicago, on July 3. The Twelfth street viaduct, work on which is under way, will probably be completed, and the Monroe street bridge is also expected to be finished. In addition, the double-deck viaduct on Canal street, from Taylor to Harrison streets, will probably be brought to completion in order to afford a freight outlet

to the west and south sides. Between \$1,000,000 and \$2,000,000 will be expended in placing the streets now torn up in condition for use, restoring several of the other viaducts to their former condition and finishing up odds and ends so that the station program may be definitely discontinued.

Over 40,000 American railway men will be engaged in the construction and operation of railways in France upon the arrival of the 5 new regiments and 19 battalions of railway engineers now being organized. These forces are in addition to the 9 regiments which have been in France since last August. More than 22,000 cars and more than 1,600 locomotives have been built in this country for use on these railways in France in addition to the equipment purchased abroad. A double-track line of railroad communication extends from the coast of France to the battlefield, including the necessary yards and sidings.

The Supreme Court of New York has rendered a decision affirming the right of the New York Central to build a bridge across the Hudson River at Castleton, N. Y., as approved by the Secretary of War. This bridge, which is a part of a low grade cut-off around the city of Albany, N. Y., is designed with two spans 600 and 405 ft. long, respectively, crossing the river. In response to demands from the city of Albany, the state legislature of New York passed a bill last year requiring a channel span 1,000 ft. long, which would have added over \$3,000,000 to the cost of the structure. The New York Central then carried the case into the courts, with the result indicated above. It is understood that the state will appeal this decision. In the decision of the Supreme Court of New York, Justice Chester stated that "it will be seen that both Congress and New York state have passed laws on the subject of proposed bridges. This being the situation, which is the controlling authority? It seems to me that there is but one answer and this answer should not be given by yielding to public sentiment or to the desires of influential public bodies who have spoken on the subject, but must be responsive to the controlling power of the supreme law of the land."

WAGE STANDARDIZATION PROPOSED

Standardization of wages paid by government departments and by contractors engaged in war work is proposed by the War Labor Policies Board, an advisory body composed of representatives of the government departments. This board, finding that the unco-ordinated competitive activities of government contractors have resulted in producing restlessness and wasteful movement of labor from one industry to another, and holding that all wages for both skilled and unskilled labor engaged in war work should be standardized, has resolved that wages paid by government departments and contractors engaged in war work should "after conference with representatives of labor and by industrial management be stabilized by this board." The resolution was signed by Felix Frankfurter, chairman of the board, and by representatives of other government departments, including W. T. Tyler, assistant director of the division of operation of the Railroad Administration.

The Senate, in passing the sundry civil appropriation bill, on June 24, inserted an amendment providing an appropriation of \$7,590,000 "to enable the Secretary of Labor during the present emergency to furnish such information and to render such assistance in the employment of wage-earners throughout the United States as may be deemed necessary in the prosecution of the war and to aid in the standardization of all wages paid by the government of the United States and its agencies." It was also provided that no money now or heretofore appropriated for the payment of wages not fixed by statute shall be available to pay wages in excess of the standard determined upon by the War Labor Policies Board.

PERSONAL MENTION

FEDERAL ADMINISTRATION APPOINTMENTS

E. B. Temple, assistant chief engineer of the Pennsylvania Railroad at Philadelphia, Pa., has been appointed engineering assistant to the Regional Director of the Allegheny region, with headquarters at the same point.

J. B. Trenholm, engineer of roadway on the Atlantic Coast Line, has also been appointed engineer of roadway of the Winston-Salem Southbound railway, and his authority as engineer of roadway on the First division of the Atlantic Coast Line has been extended over the line between Winston-Salem and Wadesboro, with office at Rocky Mount, N. C.

O. H. Wood, assistant purchasing agent of the Great Northern at Seattle, Wash., has been appointed special representative of the Central Advisory Purchasing Committee of the Railroad Administration, with headquarters in the same city. He will co-operate with that committee and assist in procuring railroad requirements of fir lumber.

E. A. Hadley, chief engineer of the Missouri Pacific, with headquarters at St. Louis, Mo., has been appointed engineering assistant to the regional director of southwestern railroads with the same headquarters, effective July 1. Mr. Hadley was born in Lowell, Mass., in 1879, and was educated in the common and high schools of that city, graduating in 1897. The same year he was apprenticed to Smith & Brooks, civil engineers at Lowell, where he remained until 1901, during which time he secured a combined course of engineering study and practice. In 1901 he entered railway service with the Boston & Maine, becoming in turn, draftsman, assistant engineer and resident engineer. On June 1, 1910, he was appointed to the position of engineer of design of the Missouri Pacific. He also served as assistant engineer in the president's office, working on special engineering investigations. In May, 1915, he was appointed chief engineer of the Missouri Pacific-Iron Mountain System, which position he held when appointed engineering assistant to the regional director as noted above.

Among the railway officers who have recently been appointed to positions of federal managers or general managers under the railroad administration, there are a number who received their early training in the engineering and maintenance of way departments. **W. B. Storey**, vice-president in charge of operation of the Atchison, Topeka & Santa Fe, has been appointed federal manager of the Atchison, Topeka & Santa Fe, the Pan Handle & Santa Fe, the Rio Grande, El Paso & Santa Fe, the Kansas Southwestern and the Grand Canyon railways. He began his railway career as an axman on the Southern Pacific, doing engineering work on various railroads and became chief engineer of the Atchison, Topeka & Santa Fe in 1900. **C. H. Ewing**, vice-president of the Philadelphia & Reading, has been appointed federal manager of the same road and of the Central of New Jersey. He entered the service of that road as a rodman, advancing to engineer of maintenance, which position he held until 1913, when he entered the operating

department. **A. T. Hardin**, vice-president of the New York Central, has been appointed assistant to the director of the eastern region, with headquarters at New York. He served consecutively as supervisor, division engineer, engineer of track and engineer of maintenance of way before being appointed assistant to the general manager. **C. E. Johnson**, general manager of the Kansas City Southern, who has had his jurisdiction extended over the Texarkana & Ft. Smith, the Midland Valley, the Houston, East & West Texas and the Vicksburg, Shreveport & Pacific, began railroad work as a chainman in 1897, holding various positions in the engineering departments of a number of southwestern railroads before becoming chief engineer of the Kansas City Southern in 1911. **W. L. Seddon**, vice-president in charge of operation of the Seaboard Air Line, has been appointed federal general manager of that property. He entered the service of the road as an instrumentman and advanced to chief engineer.

In grouping a number of railroads under federal managers, the chief engineers of some roads have had their jurisdictions extended over considerable additional territory. **J. M. Weir**, chief engineer of the Kansas City Southern, has had his authority extended over the Texarkana & Ft. Smith, the Midland Valley, the Houston, East & West Texas and the Vicksburg, Shreveport & Pacific. **V. K. Hendricks**, assistant chief engineer of St. Louis-San Francisco, has been made chief engineer of that road and also of the Missouri, Kansas & Texas lines north of the Red river. **H. R. Carpenter**, assistant chief engineer of the Missouri Pacific, has been appointed chief engineer of that road, succeeding **E. A. Hadley**, and also becomes chief engineer of the St. Louis Southwestern and the Louisiana & Arkansas. **I. A. Cottingham**, special engineer of the Southern Pacific, Texas lines, has been appointed chief engineer of the Galveston, Harrisburg & San Antonio; the Texas & New Orleans; Morgan's Louisiana & Texas; the Louisiana Western; the New Orleans, Texas & Mexico; the St. Louis, Brownsville & Mexico, and the San Antonio & Aransas Pass. **E. F. Mitchell**, chief engineer of the Texas & Pacific, has had his authority extended over the St. Louis Southwestern Railway of Texas, the International & Great Northern, the Trinity branch of the Missouri, Kansas & Texas and the Beaumont & Great Northern. **L. L. Beall**, chief engineer of the Atlanta, Birmingham & Atlantic, with headquarters at Atlanta, Ga., has also been appointed chief engineer of the Georgia railroad, the Atlanta & West Point, the Western Railway of Alabama, the Charleston & Western Carolina and the St. Louis-San Francisco lines east of the Mississippi river.

GENERAL

C. S. Krick, general superintendent of the New Jersey division of the Pennsylvania Railroad, who has been promoted to assistant general manager, with headquarters at Philadelphia, Pa., succeeding **R. L. O'Donnel**, promoted, entered railway service as a

rodman in the engineering department of this road on July 11, 1887. On December 14, 1890, he was appointed assistant supervisor on the Tyrone division, and on June 1, 1896, he was promoted to supervisor on the Philadelphia division. After serving for some time as assistant engineer and as principal assistant engineer he was promoted to superintendent of the New York Terminal division on April 1, 1907, since which time he has been in the operating department. He was promoted to the position



C. S. KRICK

of general superintendent in 1916.



E. A. HADLEY

Robert H. Boykin, assistant superintendent of maintenance of the Erie, with headquarters at New York, has been appointed assistant superintendent of terminals, succeeding R. M. Scott, who has been promoted.

N. W. Smith, superintendent of the Middle division of the Pennsylvania Railroad, who has been promoted to general superintendent of the Eastern Pennsylvania division, with



N. W. SMITH

headquarters at Altoona, Pa., was employed as a rodman on the Sunbury division of the Pennsylvania Railroad on April 24, 1893. After serving as assistant supervisor on several divisions and on experimental track work for the chief engineer maintenance of way at Harrisburg, Pa., he was appointed supervisor at Williamsport, Pa., on January 1, 1900. On May 1, 1906, he was promoted to assistant to the principal assistant engineer, and 11 months later to division engineer on the Middle division. On January 15, 1910, he was promoted to superintendent of the Central division of the Philadelphia, Baltimore & Washington, since which time he has been in the operating department.

Thomas Hall Gatlin, who has been appointed assistant to president of the Southern Railway, with headquarters at Richmond, Va., received his training in the maintenance of way department. He was born at Tarboro, N. C., on November 8, 1876, and was educated at Trinity College, Durham, N. C. He began railway work in May, 1892, in the engineering department of the Atlantic Coast Line. From 1899 to 1901 he served as chief engineer of the East Carolina Railway, and from March, 1905, to July, 1906, he was assistant chief engineer in the maintenance of way office, in charge of track work drafting and later was engineer maintenance of way on the Middle district of the Southern Railway at Knoxville, Tenn. On August 1, 1911, he was appointed assistant chief

engineer maintenance of way and structures on the Southern Railway at Washington, D. C., and from January, 1917, to June, 1918, he served as assistant to the vice-president in charge of operation, which position he held until his recent appointment as assistant to the president of the same road.

C. H. Buford, assistant superintendent of the Chicago, Milwaukee & St. Paul at Milwaukee, Wis., has been appointed superintendent of the Wisconsin Valley division of that road, with headquarters at Wausau, Wis., succeeding H. H. Ober. Mr. Buford was formerly engineer of construction on track elevation work at Chicago.

R. L. O'Donnel, assistant general manager of the Pennsylvania Railroad, who has been promoted to general manager, with headquarters at Philadelphia, to succeed **Elisha Lee**, appointed federal manager, entered railway service as a rodman on the construction of the Cornwall & Lebanon Railroad in 1882. Following this he was engaged in con-

struction work and as a draftsman in the assistant engineer's office and in the principal assistant engineer's office at Altoona, Pa. After serving in this position at several points, he was made supervisor in the Altoona yards in November, 1889. In April, 1891, he was made assistant engineer on the Tyrone division. In February, 1897, he was transferred to the operating department as assistant superintendent of the Pittsburgh division, since which time he has been promoted to superintendent, to general superintendent and to assistant general manager,

ENGINEERING

J. D. Cummin, superintendent of the Rochester division of the Erie, at Rochester, N. Y., has been promoted to inspector of maintenance of way and construction for the federal manager.

Maurice H. Brown, Jr., has been appointed assistant engineer in the maintenance of way department of the Oregon Short Line, succeeding L. I. Hammond, Jr., resigned to enter military service.

P. D. Fitzpatrick, valuation engineer and general roadmaster of the Central Vermont, with headquarters at St. Albans, Vt., has been appointed chief engineer.

A. B. Truman has been appointed division engineer of the New Mexico division of the Atchison, Topeka & Santa Fe, with headquarters at Las Vegas, N. M., succeeding **J. A. Roach**, who has entered army service, effective July 10.

H. A. Lane, chief engineer of the Baltimore & Ohio, with headquarters at Baltimore, Md., has had his authority extended in like capacity over the Western Maryland, the Cumberland Valley, the Cumberland & Pennsylvania and the Coal & Coke, having the same headquarters.

A. K. Frederickson, second assistant supervisor of tracks on the New York Central, with headquarters at Hudson, N. Y., has been appointed assistant engineer on the staff of the division engineer of the Eastern division, with headquarters at New York City, succeeding **A. A. Johnson**.

L. G. Curtis, assistant chief engineer of the Baltimore & Ohio, with office at Baltimore, Md., has been appointed chief engineer of the western lines, with office at Cincinnati, Ohio. A sketch of his railway experience appeared in the *Railway Maintenance Engineer* for July, page 248, in connection with his promotion to assistant chief engineer.

Robert Trimble, chief engineer maintenance of way of the Pennsylvania Western Lines, Northwest systems, with headquarters at Pittsburgh, Pa., has been appointed chief engineer of construction of the Western Lines, including both the Northwest and the Southwest systems, with the same headquarters, effective July 2. Mr. Trimble was born at Butler, Pa., and was educated at Western University of Pennsylvania. He began railway work in 1875, as a chainman of the Pennsylvania Company, since which he has served consecutively to 1903 in various positions in the engineering department and as principal assistant engineer of the same company. In 1903 he was appointed chief engineer maintenance of way of the same lines and now becomes chief engineer of construction, as above noted.

Robert Blaine Stokley, assistant engineer maintenance of way on the Cleveland, Cincinnati, Chicago & St. Louis, has been promoted to acting engineer maintenance of way, with headquarters at Springfield, Ohio, succeeding **W. S. Burnett**,



T. H. GATLIN



ROBERT TRIMBLE

promoted as noted elsewhere. Mr. Stokley was born at Portsmouth, Ohio, on January 20, 1885, and after attending Ohio Northern University entered railway service with the Norfolk & Western on May 1, 1910. On April 4, 1911, he went to the Big Four as assistant engineer at Indianapolis, Ind., where he remained until April 15, 1915, when he was promoted to assistant engineer maintenance of way. On September 1, 1917, he was made supervisor of track and on January 1, 1918, was promoted to assistant engineer maintenance of way, with headquarters at Springfield, which position he held when promoted to acting engineer maintenance of way, as noted above.

W. A. James, engineer of construction on the western lines of the Canadian Pacific, with headquarters at Winnipeg, Man., has been promoted to assistant chief engineer with the same headquarters, succeeding **J. M. R. Fairbairn**, who has been promoted to chief engineer, with office at Montreal, as noted elsewhere. Mr. James was born in 1864 and entered railway service with the Burlington & Missouri River as a flagman in an engineering party in 1883. From that date to 1895 he served in various positions on railway location and construction in various western states. In 1898 he went to Canada in the position of assistant engineer with the Canadian Pacific and has since been continuously employed with that road to the present time. He subsequently served successively as locating engineer, resident engineer and division engineer. In 1906 he was promoted to engineer of construction, since which time he has been in charge of a large portion of the construction and improvement work in progress on the western lines of the Canadian Pacific.

J. M. R. Fairbairn, assistant chief engineer of the Canadian Pacific, eastern lines, with headquarters at Montreal, Que., has been appointed chief engineer of the Canadian Pacific System. **J. G. Sullivan**, chief engineer, western lines, with headquarters at Winnipeg, Man., has retired from the service of the Canadian Pacific to enter private practice. Mr. Fairbairn was born at Peterboro, Ont., 45 years ago, and graduated from Toronto University in 1893. Following a short private practice in British Columbia he joined the Canadian Pacific as a draftsman at Winnipeg, Man., which position he held for two years. He subsequently served as resident engineer at Place Viger, Montreal; assistant engineer, Toronto; assistant engineer of maintenance of way, Montreal; division engineer, Toronto, and engineer maintenance of way, Montreal. In February, 1911, he was appointed assistant chief engineer, and remained in that position until his recent appointment as chief engineer of the same road, as above noted.



W. A. JAMES



J. M. R. FAIRBAIRN

William Fitzhugh Turner, assistant division engineer of the Salt Lake division of the Southern Pacific, with headquarters at Ogden, Utah, has been promoted to division engineer, with the same headquarters, succeeding **Otis Weeks**, who has accepted service with the government. Mr. Turner was born in New Orleans, La., on June 23, 1884, and after graduating from Princeton University in 1906, entered railway service the same year with the Southern Pacific as a rodman on the Coast division at San Francisco, Cal., later becoming draftsman. In November, 1908, he was promoted to assistant engineer of the Coast division, with the same headquarters, which position he held until November, 1910, when he was promoted to assistant division engineer, with headquarters at Stockton. In September, 1913, he was transferred to the Salt Lake division, with headquarters at Ogden, Utah, which position he held when appointed division engineer as noted above.

Victor King Hendricks, assistant chief engineer of the St. Louis-San Francisco, with headquarters at St. Louis, Mo., has been appointed chief engineer of this road and also chief engineer of the Missouri, Kansas & Texas lines north of the Red river, with the same headquarters. Mr. Hendricks was born on May 28, 1869, and after graduating from the Rose Polytechnic Institute in June, 1889, entered railway work the following year as a rodman for the Fairhaven & Southern. He remained with this road until January, 1892, having become draftsman and transitman on construction. On this date he went to the Birmingham Bay & Eastern as assistant engineer in charge of construction. In the same year he became draftsman for the Indiana & Lafayette Bridge Works, where he remained but a few months, returning to railway service as an assistant engineer for the Terre Haute & Indianapolis. In January, 1894, he was made engineer maintenance of way of the Logansport division of that road, and in December, 1898, was promoted to engineer maintenance of way of the Terre Haute & Logansport. Mr. Hendricks went to the Baltimore & Ohio in June, 1902, as assistant to the engineer maintenance of way, and three years later was made division engineer at Baltimore. He resigned this position in January, 1907, to become assistant engineer maintenance of way of the St. Louis-San Francisco lines. From February, 1910, to October, 1911, he was office engineer of those lines when he was promoted to principal assistant engineer in charge of timber preservation of the St. Louis-San Francisco and the Chicago & Eastern Illinois. In 1913 he was appointed assistant chief engineer,



V. K. HENDRICKS

W. A. Murray, division engineer of the Pennsylvania division of the New York Central, with office at Jersey Shore, Pa., has been transferred to the Mohawk division, with headquarters at Albany, N. Y., succeeding **C. E. Lindsay**, who has resigned to accept a position on the Board of Railroad Wages and Working Conditions under the United States Railroad Administration. **G. N. Edmondson**, division engineer of the Rochester division, with headquarters at Rochester, N. Y., has been transferred to Jersey Shore, succeeding Mr. Murray. **J. W. Stevens**, supervisor of track, with headquarters at Clearfield, Pa., has been appointed acting division engineer of the Rochester division, succeeding Mr. Edmondson. **A. R. Jones**, assistant engineer in the office of engineer of track at New York, has been appointed supervisor at Clearfield, Pa., succeeding Mr. Stevens. **A. E. Johnson**, assistant engineer on the staff of division engineer of the Eastern division at New York, succeeds Mr. Jones.

W. A. Murray, division engineer of the Pennsylvania division of the New York Central, with office at Jersey Shore, Pa., has been transferred to the Mohawk division, with headquarters at Albany, N. Y., succeeding **C. E. Lindsay**, who has resigned to accept a position on the Board of Railroad Wages and Working Conditions under the United States Railroad Administration. **G. N. Edmondson**, division engineer of the Rochester division, with headquarters at Rochester, N. Y., has been transferred to Jersey Shore, succeeding Mr. Murray. **J. W. Stevens**, supervisor of track, with headquarters at Clearfield, Pa., has been appointed acting division engineer of the Rochester division, succeeding Mr. Edmondson. **A. R. Jones**, assistant engineer in the office of engineer of track at New York, has been appointed supervisor at Clearfield, Pa., succeeding Mr. Stevens. **A. E. Johnson**, assistant engineer on the staff of division engineer of the Eastern division at New York, succeeds Mr. Jones.

E. J. Bayer, who was assistant engineer maintenance of way of the Cleveland-Indianapolis division of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Galion, Ohio, has been appointed acting engineer maintenance of way of the same road, with headquarters at Mt. Carmel, Ill. Mr. Bayer was born at Cincinnati, Ohio, on April 1, 1888, and after graduating from Purdue University in 1910, entered railway service with the Cleveland, Cincinnati, Chicago & St. Louis as a rodman on the Cairo division at Mt. Carmel, Ill. He has remained in continuous service with this road, serving in turn as transitman, assistant engineer and assistant engineer maintenance of way. He held this later position when promoted to acting engineer maintenance of way as noted above.

Robert Culin White, division superintendent on the Missouri Pacific, with headquarters at Wynne, Ark., has been promoted to assistant chief engineer, with headquarters at St. Louis, Mo., succeeding

H. R. Carpenter, promoted, effective July 1. Mr. White was born at Bertrand, Mo., on February 8, 1881. He attended the University of Missouri, and later entered West Point, leaving the latter institution in June, 1905, to become an assistant on an engineering corps of the Missouri Pacific, with headquarters at St. Louis, Mo. The following two years he was assistant engineer and roadmaster on the Eastern, Central Kansas and White River divisions. From September, 1908, to April, 1914, he was consecutively assistant engineer, division engineer and general roadmaster on the Memphis, Central and Arkansas divisions of the Southern district. In April, 1914, he was appointed engineer maintenance of way of the Southern district, with headquarters at Little Rock, Ark., and on January, 1917, he was made division superintendent,



R. C. WHITE

W. C. Kegler, engineer maintenance of way of the Cleveland-Indianapolis division of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Galion, Ohio, has been appointed district engineer in charge of construction, with the same headquarters. **W. S. Burnett**, engineer maintenance of way of the Cincinnati-Sandusky division, with headquarters at Springfield, Ohio, has been appointed district engineer in charge of construction, with the same headquarters. **J. E. Kissell**, engineer maintenance of way of the Cairo division, with headquarters at Mt. Carmel, Ill., has been appointed acting engineer maintenance of way at Galion, Ohio, in place of Mr. Kegler.

Robert D. McKeon, acting assistant division engineer on the Pennsylvania, Western Lines, southwest system, with headquarters at Pittsburgh, Pa., has been appointed division engineer on the northwestern system, with headquarters at Ft. Wayne, Ind., succeeding **Guy Scott**, who entered military service. Mr. McKeon was born at Arcanum, Ohio, on May 7, 1880, and after graduating from Ohio State University in 1902, entered railway service with the Pittsburgh, Cincinnati, Chicago & St. Louis on the Logansport division as assistant on the engineering corps. In September, 1906, he was transferred to the Pittsburgh division, where he remained until 1912, when he was transferred to the Michigan division. He served in this capacity until October 1, 1915, when he was promoted to assistant division engineer. On July 1, 1918, he was promoted to division engineer, as noted above.

James C. Patterson, office engineer on the Erie, has been appointed principal assistant engineer of that road, with headquarters at New York City. Mr. Patterson was born at

Carmichaels, Pa., in 1882. He graduated from Pennsylvania State College with the class of 1905. Immediately after graduating he entered railroad service with the Pennsylvania, where he served until August, 1906, when he resigned to enter the employ of the New York Central, remaining with that road until April, 1907. For the next six months he was employed by the Cleveland, Cincinnati, Chicago & St. Louis and from October, 1907, to April, 1909, he was in the employ of John C. O'Bryan, consulting engineer. He returned to railway service with the Northern Pacific in April, 1909, and in October, 1909, he went to the Chicago Great Western. He was appointed chief draftsman on the Erie in July, 1913, and in May, 1916, was promoted to assistant valuation engineer. He was made office engineer in February, 1917, which position he held until receiving his appointment as principal assistant engineer, noted above.

E. O. Reeder, assistant chief engineer of the Puget Sound Line of the Chicago, Milwaukee & St. Paul, with headquarters at Seattle, Wash., whose resignation from that position was announced in the July issue, has been connected with the Chicago, Milwaukee & St. Paul for many years. His first employment with that company was in the purchasing department previous to 1875, where he was connected with the purchases of ties, lumber, etc. His first work in the engineering department was in connection with the construction of a tunnel at Tunnel City, Wis. In 1879, he became resident engineer at Melvina, Wis., and had charge of the engineering work between Melvina, Wis., and Westby. Later he was transferred to Fayette, Iowa, following which he assisted in the survey and location of the bridge over the Mississippi river at Sabula, Iowa. Subsequently, he was engaged in a number of surveys, including the line from Monroe, Wis., to Dubuque, Iowa, and the Ottumwa line from Cedar Rapids, Iowa, to Sigourney. Later, Mr. Reeder took charge of the chief engineers' office, where he had much to do with the location of the Puget Sound line. He then became principal assistant engineer. He was appointed chief engineer of the Puget Sound lines, with headquarters at Seattle, Wash., in June, 1911, and was made assistant chief engineer when this line was consolidated with the St. Paul. He remained in that position until he resigned because of ill health.

W. C. Cushing, chief engineer maintenance of way of the Pennsylvania Lines, Southwest System, with headquarters at Pittsburgh, Pa., has been appointed chief engineer maintenance of way of all of the Pennsylvania Lines West, including the Pittsburgh, Fort Wayne & Chicago, the Pittsburgh, Cincinnati, Chicago & St. Louis, the Cincinnati, Lebanon & Northern and the Lorain, Ashland & Southern, with headquarters at Pittsburgh. Mr. Cushing was born at St. John, N. B., on March 18, 1863, and after graduating from the University of New Brunswick and the Massachusetts Institute of Technology, entered railway service in 1887 with the Pennsylvania as a rodman in the engineering corps on what is now the Louisville division. On January 27, 1889, he was promoted to engineer maintenance of way of the Cincinnati & Muskingum Valley, which is now the Zanesville division, where he remained a year, becoming division engineer of the Indianapolis division in 1890. On June 1, 1894, he was transferred to the Pittsburgh division as division engineer, becoming superintendent of this division in 1901. On January 1, 1902, he was transferred to the Eastern division as superintendent and on January 1, 1903, was made chief engi-



W. C. CUSHING

neer maintenance of way of the Southwest system, which position he held when appointed chief engineer maintenance of way, as noted above.

Lem Adams, engineer-accountant in the office of the engineer maintenance of way of the Oregon Short Line, has been appointed contract engineer in the maintenance of way department, with headquarters at Pocatello, Idaho. Mr. Adams was born in Buda, Tex., on June 4, 1886, and after graduating from the Texas Agricultural and Mechanical College, entered railway service in June, 1909, with the Oregon Short Line as a rodman. He left this position in a short time to go with the King Hill Irrigation Company at Glenns Ferry, Idaho, where he remained a year, returning in September, 1910, to the Oregon Short Line in his previous capacity as rodman. He was promoted to draftsman in October of the same year and in July, 1911, was made estimator. He held this position until 1914, when he was promoted to chief draftsman. His next promotion was to that of assistant division engineer of the Idaho division in April, 1916, and to engineer-accountant in August, 1917.

John G. Sullivan, chief engineer of the Canadian Pacific, western lines, with headquarters at Winnipeg, Man., has retired from the service of the Canadian Pacific to enter private practice. He was born at Bushnells Basin, Monroe County, N. Y., on June 11, 1863, and graduated from Cornell University in 1888, entering railway service the same year with the Great Northern as a rodman. The following year he entered the service of the Spokane Falls & Northern, now a part of the Great Northern, as instrument man and assistant engineer. Later he became assistant engineer on the Great Northern and in 1890, assistant engineer with the Alberta Railway & Coal Company. In 1894 he was made locating engineer for the Butte, Anaconda & Pacific and the succeeding year was appointed principal assistant engineer of the Kaslo & Slocum. From 1896 to 1900 he was in the service of the Columbia & Western, now a part of the Canadian Pacific, becoming principal assistant engineer in charge of construction and operation. The next five years he was with the Canadian Pacific, western lines, as division engineer in charge of all new construction, and in 1905 he became assistant chief engineer for the Isthmian Canal Commission, going to Panama in September of that year. He returned from Panama in 1907, and became manager of construction on the eastern lines of the Canadian Pacific. In September of the next year he was appointed assistant chief engineer of the eastern lines, where he remained until February, 1911, when he was transferred to the western lines in the same capacity. Eight months later he was made chief engineer, western lines, which position he held when he resigned.

Edward M. Durham, Jr., assistant chief engineer of construction of the Southern Railway, has been promoted to chief engineer of construction of the Southern Railway System, with headquarters at Washington, D. C., succeeding **W. H. Wells**, who has been appointed consulting engineer of construction of the Carolina, Clinchfield & Ohio, the Carolina, Clinchfield & Ohio of South Carolina, the Georgia, Southern & Florida and the Alabama & Vicksburg, with headquarters at Washington, D. C. Mr. Durham has also been made chief engineer of the Alabama & Vicksburg, the Georgia Southern & Florida, the Carolina, Clinchfield & Ohio and the Carolina, Clinchfield & Ohio of South Carolina. Mr. Durham was born at Memphis, Tenn., on October 23, 1875,

and was educated at Lehigh University. He began railroad work with the Chicago & North Western in 1899, and subsequently served on the Southern railway as assistant engineer at Selma, Ala. In 1901 he was appointed assistant engineer at Birmingham, Ala., and in 1905 became principal assistant engineer at Birmingham. In 1914 he went to the Atlanta, Birmingham & Atlantic as special valuation engineer, with office at Atlanta, Ga., and in 1916 he returned to the service of the Southern as general agent at Chattanooga Tenn. The following year he was appointed assistant chief engineer of construction, with office at Washington.

TRACK

J. Quinn has been appointed supervisor of track on the Grand Trunk lines in New England, west of Shelbourne, N. H.

J. Collins, section foreman on the Oregon Short Line at Richfield, Idaho, has been appointed roadmaster of the Glenns Ferry district, with headquarters at Glenns Ferry, Idaho, succeeding **J. D. McCauley**, who has been granted a leave of absence.

J. Haas, extra gang foreman on new construction work on the Atchison, Topeka & Santa Fe in Texas, has been promoted to roadmaster, with headquarters at Canadian, Tex., succeeding **E. E. Crowley**, who has been transferred to Amarillo in place of **F. B. Hart**, who has entered military service.

D. Foley, roadmaster on the Michigan Central, with headquarters at Jackson, Mich., has been promoted to inspector. **M. Cummerford**, roadmaster on the Air Line, with headquarters at Jackson, Mich., has been transferred to the main line, with jurisdiction over the line between Detroit and Jackson. **J. McConnell**, roadmaster on the Bay City division, with headquarters at Lapeer, Mich., has been transferred to the main line, with supervision over the track between Jackson and Kalamazoo. **P. Margraf**, assistant roadmaster, has been promoted to roadmaster on the Bay City division, with supervision over the line between Detroit and Bay City, succeeding **J. McConnell**. **M. Burns**, assistant roadmaster, has been promoted to roadmaster on the main line, with jurisdiction over the line between Kalamazoo and Niles. **G. W. Gafford**, section foreman, has been promoted to assistant roadmaster on the main line between Niles and Michigan City, Ind., while **T. McDonald**, yard foreman at Kensington, Ill., has been promoted to assistant roadmaster on the main line between Michigan City and Kensington.

Charles J. Eggert, the announcement of whose appointment as general roadmaster of the Galesburg division of the Chicago, Burlington & Quincy, with headquarters at

Galesburg, Ill., appeared in the July issue of the *Railway Maintenance Engineer*, was born at Tyrona, Pa., on November 2, 1866. After receiving a common school and business college education he entered railway service with the St. Louis-San Francisco as a water boy and section laborer in June, 1880. He left this position in September, 1884, to become section foreman with the Denver & Rio Grande, where he was later made extra gang and general yard foreman. He remained in this capacity until March, 1889, when he was made extra gang foreman on the Frisco. In October, 1893,



C. J. EGGERT

he again resigned to accept a position as yard foreman and extra gang foreman with the Chicago, Rock Island & Pacific. In 1902 he was promoted to roadmaster, where he remained until June, 1906, when he left that road to become a road-

master on the Chicago, Burlington & Quincy, with headquarters at Brookfield, Mo. He was transferred to the La Crosse division in September, 1910, which position he held when appointed general roadmaster, as noted above.

C. Johnson has been appointed roadmaster on the Second district of the First division of the Denver & Rio Grande, with headquarters at Canon City, Colo., succeeding **C. Kersey**.

Gus Blaser, roadmaster of the Kemmerer district of the Oregon Short Line, with headquarters at Kemmerer, Wyo., has been transferred to the Idaho division in charge of the Minidoka district, with headquarters at Minidoka, Idaho, succeeding **J. E. Schiller**, who has been granted a leave of absence.

A. Benford has been appointed supervisor of track on the Ludington division of the Pere Marquette, with headquarters at Saginaw, Mich., succeeding **L. H. Bell**, who has resigned to accept service elsewhere. Mr. Benford was born in Alliance, Ohio, on October 15, 1865, and attended high school at Traverse City, Mich. He entered railway service with the Ann Arbor in May, 1887, working in a construction gang. In 1892, after working on a section, he was promoted to foreman, later having charge of extra gangs during the summer months, and returning to the section in the winter months. He remained in the employ of the Ann Arbor until March, 1901, when he went to the Grand Trunk as extra gang foreman. In May, 1903, he went to the Pere Marquette at Saginaw, Mich., having charge of the yards at that point and doing extra gang work. He was holding this position when he was promoted to supervisor of track, as noted above.

William Shea, roadmaster on the Middle district of the Kansas City division of the Chicago, Milwaukee & St. Paul, with headquarters at Blakesburg, Iowa, was promoted to general roadmaster in charge of lines east of Mobridge, S. D., effective July 1. He was born at Eddyville, Iowa, on August 31, 1867, and after graduating from the high school at that point entered railway service as a water boy on the construction of the Humes-ton & Shenandoah in southwestern Iowa, now a part of the Burlington, in 1881. On May 20, 1884, he entered the employ of the St. Paul as an assistant foreman in charge of a gang laying track on the line then being built between Marion, Iowa, and Ottumwa. On the completion of this work he was made a section foreman, which position he held until 1890, when he was made roadmaster on the Chicago & Council Bluffs division. In the following year he was transferred to Ottumwa, Iowa, where he was placed in charge of the Middle district of the Kansas City division. In 1909 he was made general roadmaster of the Kansas City division. On the elimination of this position two years later he returned to the position of roadmaster of the Middle subdivision.

Charles C. Clark, general track foreman on the Salt Lake district of the Oregon Short Line, has been appointed roadmaster of the Kemmerer district, with headquarters at Kemmerer, Wyo., succeeding **Gus Blaser**, who has been transferred to the Idaho division. Mr. Clark was born in Ohio on December 6, 1872, and after a common school education entered railway service on April 1, 1887, with the Cleveland, Canton & Southern in the construction department. In May, 1906, he was appointed roadmaster of the Sierra Railway of California, where he remained until October, 1906,

when he was made general foreman of the Union Pacific Terminals at Omaha, Neb. On January 10, 1907, he was promoted to roadmaster on the Nebraska division in charge of lines south of Valley, Neb. He returned to the Sierra Railway of California as supervisor of bridges and buildings in February, 1909, and remained in this position until July 1, 1914, when he went to the Oregon Short Line, becoming general track foreman of the Salt Lake division, the position he held when appointed roadmaster, as noted above.

BRIDGE

J. Gibson has been appointed supervisor of bridges and buildings on the Grand Trunk lines in New England.

Frank H. Gilligan, assistant supervisor of bridges and buildings on the Boston & Albany at Worcester, Mass., has been promoted to supervisor of bridges and buildings at that point, succeeding **E. K. Mentzer**. Mr. Gilligan was born at Wilbraham, Mass., on November 9, 1867, and began railway work in May, 1891, as a bridge man with the Boston & Albany. From January, 1900, to February, 1903, he served as bridge inspector; from January, 1904, to January, 1910, as bridge foreman, and from January, 1910, to June 15, 1918, as assistant supervisor of bridges and buildings, when he received his appointment as supervisor of bridges and buildings as noted above.

PURCHASING

L. M. Jones, assistant to the general manager of the Norfolk Southern, with office at Norfolk, Va., has been appointed purchasing agent.

E. W. Grice, assistant to the president of the Chesapeake & Ohio, has been appointed manager of purchases, stores and safety, with headquarters at Richmond, Va.

W. S. Galloway, assistant purchasing agent of the Baltimore & Ohio, with office at Baltimore, Md., has been appointed purchasing agent, western lines, with headquarters at Baltimore.

A. S. McKelligon, storekeeper of the Southern Pacific at Sacramento, Cal., has been appointed general storekeeper with headquarters at San Francisco, Cal., succeeding **H. G. Cook**, who has resigned.

W. A. Starritt, purchasing agent of the Carolina, Clinchfield & Ohio and the Carolina, Clinchfield & Ohio of South Carolina at Johnson City, Tenn., has been appointed local purchasing agent, with headquarters at Johnson City.

H. P. McQuilkin has been appointed assistant general storekeeper of the Baltimore & Ohio, with headquarters at Baltimore, Md., succeeding **E. W. Thornley**, who has been given a leave of absence to accept service in the office of the Allegheny Regional Purchasing committee.

C. S. Goldborough, assistant to the president of the Erie, with headquarters at New York, has been appointed assistant to the federal manager with jurisdiction over the purchasing and stores department, and will perform other duties assigned to him.

C. A. How, general purchasing agent of the Missouri Pacific at St. Louis, Mo., and a member of the Western Regional Purchasing Committee recently dissolved, has been made chairman of the Regional Purchasing Committee for the Southwestern Region, with headquarters at St. Louis. **J. L. Cowan**, purchasing agent of the San Antonio & Aransas Pass, at San Antonio, Texas, has been made a member of this committee.

L. S. Carroll, general purchasing agent of the Chicago & North Western, with headquarters at Chicago, has been appointed chairman, and **F. A. Bushnell**, purchasing agent of the Great Northern at St. Paul, Minn., has been appointed a member of the Regional Purchasing Committee for the Northwestern region by the United States Railroad Administration, with office at 226 W. Jackson Blvd., Chicago, effective



WILLIAM SHEA

tive July 18. Mr. Carroll and Mr. Bushnell have been members of the Western Region Purchasing Committee, which is now dissolved.

Robert Baker Pegram, executive general agent for the Southern Railway at Memphis, Tenn., has been appointed general purchasing agent of the Southern Railway System, the Alabama & Vicksburg, the Georgia, Southern & Florida, the Carolina, Clinchfield & Ohio and the Carolina, Clinchfield & Ohio of South Carolina, with headquarters at Washington, D. C. Mr. Pegram was born at Marion, Ala., on August 22, 1874, and was educated in private schools at Memphis. He began railway work with the Southern in July, 1890. In 1895 and 1896 he was chief clerk of the Memphis Freight Bureau and later in the latter year he served as chief clerk to the assistant general freight agent of the Illinois Central at Memphis. In January, 1904, he was appointed soliciting freight agent of the Southern railway and subsequently served as commercial agent at the same place, and later as chief clerk to the vice-president at St. Louis, Mo. In December, 1905, he was appointed assistant general freight agent at Nashville, Tenn., and in April, 1907, he was promoted to general freight agent at the same place, subsequently serving as general freight agent at Charleston, S. C. On May 1, 1910, he was appointed general agent, executive department, with office at Charleston, and since January, 1917, was executive general agent with office at Memphis until his recent appointment.

MILITARY SERVICE

J. M. Hammond, formerly assistant to the chief engineer of the Kansas City Terminal, has been commissioned captain in the construction division of the Quartermaster's Corps and assigned to duty at Washington.

OBITUARY

Clarence R. Neher, consulting engineer, Buffalo, N. Y., who died recently in that city, was employed at various times in an engineering capacity by a number of railroads, principally the Ohio & Western and the Richmond & Danville. He served at one time as division engineer on the Rochester division of the Western New York & Pennsylvania.

E. S. Meloy, assistant engineer in charge of bridge erection and bridge inspection on the staff of the chief engineer of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, died in that city on July 8, after an extended illness. Mr. Meloy entered railway service with the New York & New England in 1878, as a chainman, and was in service on a number of railroads, including the Chicago & North Western, until 1886, when he entered the employ of the Chicago, Milwaukee & St. Paul as a draftsman. In 1890 he was promoted to assistant engineer, which position he held at the time of his death.

Dr. Edgar Marburg, professor of civil engineering in the University of Pennsylvania, and secretary-treasurer of the American Society for Testing Materials, died at the University hospital, Philadelphia, Pa., on June 27, 1918, after an illness dating back two years. Dr. Marburg was born in 1864, and graduated from the Rensselaer Polytechnic Institute, Troy, N. Y., in 1885, with the degree of civil engineer. He served successively after graduation in the engineering departments of the Keystone Bridge Company, the Phoenix Bridge Company, the Edge Moor Iron Company and the Carnegie Steel Company, going to Philadelphia in 1892 to accept the professorship of civil engineering at the University of Pennsylvania, where he remained until his death. Dr. Marburg is best known for his excellent work and organizing ability as secretary and treasurer of the American Society for Testing Materials, which society he helped to organize in 1898 under the name of the International Association for Testing Materials. In 1902 the American Society for Testing Materials was started as an independent body. When the society was organized its membership included 175; today its members number 2,300.

CONSTRUCTION NEWS

The Baltimore & Ohio has awarded contracts for the following improvements: Ice house at St. George, S. I., N. Y., to the Youngstown Construction Company, New York City; additional tracks at tunnels at Wharton Street and Grays Ferry Road, Philadelphia, to the Empire Engineering Company, Inc., Baltimore, Md.; additional yard and shop buildings at Wilmington, Del.; for the yard to the Empire Engineering Company, Inc., Baltimore, and for the buildings to Frainie Brothers & Haigley, Baltimore; extension of yards at Bayview, Mt. Winans, Baltimore, and additional tracks at Claremont to the Empire Engineering Company, Inc., Baltimore; thawing shed at Curtis Bay to the Surety Engineering Company, New York; ice house and roundhouse at Grafton, W. Va., to Frainie Brothers & Haigley, Baltimore; additional yard tracks at Keyser, W. Va., to the James F. McCabe Company, Baltimore; addition to round house at Grafton, W. Va., to Frainie Brothers & Haigley, Baltimore; storage tracks at Flemington, W. Va., to the Empire Engineering Company, Inc., Baltimore; heavy repair shop at Glenwood, Pa., to Westinghouse, Church, Kerr & Co., New York; extension of second track at Evans, Pa., to James F. McCabe Company, Baltimore; and for company houses at Holloway, O., to the Drum Construction Company, Chicago.

This road has also awarded a contract for the construction of a new locomotive shop at Cumberland, Md., to Westinghouse, Church, Kerr & Co., New York, at an estimated expenditure of \$1,200,000.

The Chicago & Alton is preparing plans for a brick freight house at Kansas City, Mo., which will be 520 ft. by 36 ft. The building will have a slate roof supported by timber trusses and for a distance of 300 ft. will have a second story, which will be occupied by the general agent and the division superintendent's forces.

This company is asking bids on the reinforcing of a bridge five miles north of Godfrey, Ill., on the line from Godfrey to Roodhouse, which will involve jacketing five 40-ft. stone arches with concrete. The railroad is also preparing to rebuild its bridge over the Wood river two miles south of Alton, Ill., which work will necessitate the widening and deepening of the channel of the river. The bridge will be lengthened and the substructure rebuilt. Spans which the Alton has in stock will be used for the superstructure.

The Chicago & Eastern Illinois has ordered four girder spans, 445 tons, from the American Bridge Company for use at Milford, Ill.

The Chicago, Burlington & Quincy will build a bridge across the North Platte River at Bridgeport, Neb., to cost about \$150,000, the foundations of which will be constructed for double track, although only a single track superstructure will be erected at present.

The Chicago, Milwaukee & St. Paul has started the construction of connections with the Chicago & North Western outer belt line in the Chicago switching district in order to make its Godfrey yard accessible for its Chicago-Milwaukee line. One connection is being built to the belt line at Bensonville, Ill., just west of the Godfrey yard, and the other at Techny, on its main line to Milwaukee, Wis. The contract for the grading on the Bensonville connection has been awarded to John McAndrews, Chicago, and the grading on the Techny connection is being done by John Marsch, Inc., Chicago. Counting some additional tracks in the Godfrey yard, 4.4 miles of double track will be laid at a cost of about \$300,000, this work being done by company forces.

This road has also commenced grading on double track construction in Minnesota. Second track will be laid to connect up all the gaps in the present double track from St. Paul, Minn., to Aberdeen, S. D. The contract for the

grading has been awarded to Morris & Dougherty, St. Paul, while all of the track laying will be done by the railroad company's forces.

The St. Paul is preparing to rebuild its bridge over the Missouri River at Chamberlain, S. D. A new pontoon, 266 ft. long, and two steel truss spans each 300 ft. long will be erected by company forces.

This company is also rebuilding its engine house at Calmar, Iowa, which was recently destroyed by fire.

The Cleveland, Cincinnati, Chicago & St. Louis is building second track on its Cleveland-Indianapolis division from Farmland, Ind., to Ansonia, Ohio, a distance of 26 miles, and from Bellefontaine, Ohio, to Marion, a distance of 39 miles. The company is also planning improvements to its yards in the vicinity of Cincinnati, which will cost approximately \$500,000. At Galion it is planned to construct an engine terminal consisting of a 15-stall round house and a 90-ft. turntable and appurtenances. Some small additions will also be made to the Beech Grove and Brightwood yards at Indianapolis, Ind.

The Electric Point Mining Company has completed preliminary surveys for a railroad between Leadpoint, Wash., and Boundary, 11 miles. The construction of this line will involve the erection of two bridges totaling 120 ft. in length. The principal commodity which will be carried by the line will be ore.

The Lehigh Valley is constructing a new engine terminal at Ashmore, Pa., with company forces. This terminal consists of a 25-stall concrete engine house, a small section of which will eventually be a brick erecting shop, ash pits of the submerged type, a temporary locomotive coaling station and the necessary track layout.

The Pennsylvania Railroad, Western Lines, have awarded a contract to the Austin Company, Cleveland, O., for the construction of engine terminals at several points on that system. This work will include the standard roundhouse of steel construction with reinforced concrete roof and 75-ft. bridge cranes. These buildings will be provided with smoke exhaust and washing systems. The first structure of this type will be erected at Crestline, O., and will be a 30-stall house costing approximately \$500,000, which is to be completed in 120 days. It is planned to begin similar work at Richmond, Ind., in the near future. The Austin Company has also been awarded a contract for the construction of a locomotive erecting and machine shop 200 ft. by 420 ft. at Logansport, Ind., costing approximately \$600,000, and to be built according to the designs and specifications of the Austin Company. This shop, which will be equipped with a 250-ton bridge crane, is also to be completed in 120 working days.

The Philadelphia & Reading has awarded a contract to D. S. Warfel, Lancaster, Pa., for putting up a new machine shop at Rutherford, Pa. The building is to be a one-story structure, 20 ft. wide by 158 ft. long, of brick construction on concrete foundation and base, with steel frame roof and steel sash.

The San Diego & Arizona is preparing plans for shops, an engine house and a freight depot at San Diego, Cal.

The Toledo & Ohio Central has contracted with the Austin Company, Cleveland, Ohio, for a complete roundhouse layout at its West Columbus, O., yards, which will cost approximately \$250,000, and which must be completed in 90 working days. The main structure is to be a 20-stall reinforced concrete roundhouse, with additional structures, including a machine shop, boiler house and oil house.

TRACK SUPPLIES

The Pittsburgh & West Virginia has placed an order with a Pittsburgh concern for 500 kegs of spikes.

The Baltimore & Ohio has placed an order with a Pittsburgh concern for 1,000 kegs of spikes.

SUPPLY TRADE NEWS

GENERAL

The Cleveland Frog & Crossing Co., Cleveland, O., recently obtained a permit to construct a storage building 40 by 60 ft. to cost approximately \$3,000.

The Anti-Creeper Corporation of New York announces that **Howard A. Butler** has been elected president and secretary, succeeding **Ellsworth L. Mills**, resigned; and **James G. Shaw** has been elected treasurer to replace **Herbert W. Lockwood**. **Mr. Mills** has also resigned as treasurer of the Creepcheck Company.

The Pittsburgh Testing Laboratory announces its removal on July 1 from temporary quarters in the B. F. Jones Law building to its new office and laboratory buildings at 612-620 Grant Street, Pittsburgh, Pa. The laboratories will be larger and better equipped than those in the company's old quarters, the P. T. L. building at Seventh and Bedford Avenues, which were turned over for use by the government on April 1.

PERSONAL

Frank C. Hasse, district superintendent of the Oxbeld Railroad Service Company, has been commissioned a captain in the Quartermasters Corps of the National Army.

Charles R. Hook, vice-president of the American Rolling Mill Company, at Middletown, Ohio, has been elected a director of that company, succeeding the late J. G. Battelle, of Columbus, O.

L. C. Sprague, of the railroad department of the H. W. Johns-Manville Company, New York, has been appointed a special representative of the Chicago Pneumatic Tool Company in connection with the sale of pneumatic tools to railroads.

Ray Frazer, general manager of the Lyle Corrugated Culvert Company, Minneapolis, Minn., died June 17, ten days after meeting with an injury in an automobile accident. Mr. Frazer was born at Pleasant Town, near Topeka, Kan., on December 9, 1882. Five years later he moved to Lyle, Minn., where he received his early education. He entered Carleton College, Northfield, Minn., in 1889, where he remained for two years. After spending several years in the drug business he became connected with the Lyle Corrugated Culvert Company as manager. Upon the removal of the headquarters of that company to Minneapolis he was made general manager of all of the company's activities. One of his recent developments has been the metal sign business, he being actively interested in the design and building of the machines now being used for the manufacture of Lyle signs.

Robert Brown Carnahan, Jr., vice-president of the American Rolling Mills Company at Middletown, O., was accidentally killed on June 22. He was educated at the University of Pittsburgh, graduating with the class of 1891. Upon the completion of his university work he became associated with the Dewees-Wood Company at McKeesport, Pa., where he was engaged in research work in connection with coal mine prospects. He remained with that concern until 1899, when he went to the Homestead Works of the Carnegie Steel Company, where he was engaged in special work in connection with the manufacture of open hearth steel. In 1900 he entered the service of the American Rolling Mills Company at the time that company organized its business, and was located at what is now known as the central works. He was there employed as chief chemist and open hearth superintendent. Under Mr. Carnahan's direction the Armco American ingot iron was developed.



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